

# EMR and Health

Quarterly report on electromagnetic radiation, health and well-being

Vol 15 No 3 July 2019

## Insurance risks

A major insurer has warned about the risks of emerging technologies.

Swiss Re, one of the world's leading providers of reinsurance and insurance, has released a new report which identifies potential insurance risks of digital and radiation-emitting technologies.

Published in May, 'SONAR, New Emerging Risk Insights,' identifies new, changing and not-yet-envisioned risks that the re/insurance industry needs to have on its radar. Among the risks identified in this report are those from the implementation of new technologies, 5G and social media.

Fifth generation (5G) technologies will allow high-speed, internet access with higher capacity. In addition to devices used by people, it will be used to connect machines to each other, known as the Internet of Things (IoT). According to the report, the roll-out of 5G networks will require more antennas and this will involve more exposure to electromagnetic radiation (EMR). 'An update in liability claims could be a potential long-term-consequence,' the report states. 'Potential claims for health impairments may come with a long latency.'

As well as the potential health effects of exposure, the report identifies a number of other risks from 5G technologies.

5G increases the risks of cyber attacks which could download more information faster. 'The potential for espionage or sabotage could affect international



cooperation, and impact financial markets negatively,' the authors concluded.

The report also addresses potential problems from the rapid evolution of technology. 'Large infrastructure breakdowns or accidents triggered by new software not working with old hardware can lead to property damage, bodily injury and business interruptions claims,' the report says.

Another emerging risk identified in the report is the consequence of internet use, including social media. 'Our online activity—our data—is being used to analyse patterns and predict behaviours, for sale on to the highest bidder. Monetising data is key for corporate profit,' the report says. It gives, as an example, the fact that music choices and sleep patterns from wearable devices can be analysed to detect signs of depression.

'The constant collection of our data means we are constantly being observed, analysed, compared and rated,' it says.

The report shows that insurers are taking note of the potential risks of these technologies and only time will tell how they translate into litigation and affect insurance premiums.

Swiss Re, 'SONAR', New Emerging Risk Insights', <https://www.swissre.com/institute/research/sonar/sonar2019.html>

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# Powerlines and leukemia

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The French radiation agency has reaffirmed its advice to limit exposure to magnetic fields

In late June, the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) released a report showing a link between long-term exposure to electromagnetic fields and health problems. After reviewing the evidence, the Agency reaffirmed its 2010 advice to limit exposure to these fields for vulnerable people and to better manage occupational exposures.

The report found that approximately 40,000 children are exposed to magnetic fields above the level classified as a class 2B carcinogen (above 4 mG) by the International Agency for Research on Cancer (IARC). Another 8000 are exposed to such fields at school.

'In view of these results, the Agency is again recommending a precautionary approach that would limit the number of vulnerable people exposed to high-voltage power lines, as well as limiting exposure. To this end, it recommends not building or developing new facilities attended by vulnerable people (hospitals, schools, etc.) immediately next to very-high voltage power lines, or running new power lines over these facilities,' the report states.

The report also has recommendations for workers, some of whom have been found to work in fields of over 100 mG. 'ANSES reiterates the importance of enforcing regulatory provisions in occupational health and limiting situations of over-exposure, particularly by adapting workstations. In addition, ANSES recommends that manufacturers of industrial machines emitting low-frequency electromagnetic fields measure the exposure associated with machine use, and include these data in the technical specifications provided to customers and users.'

The report also recommends providing information to pregnant women about how to limit their exposure.

<https://www.anses.fr/en/content/health-effects-associated-exposure-low-frequency-electromagnetic-fields>

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## NBN, 5G—and how we can help

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There's no doubt about it. There's growing concern about the rollout of 5G networks and communities are protesting about the construction of 5G antennas near their homes.

But did you know there's another source of 5G transmitters even closer to home?

Generally speaking NBN boxes, modems or routers and the digital devices that connect to them (such as laptops, PCs, smart TVs, tablets) emit radiofrequency radiation and soon they'll all be talking to each other using 5G. In other words, our homes will be mini 5G hotspots.

Turning off the 'wireless' button on a modem, doesn't always stop the emissions. The only way to do that is to turn the modem off at the powerpoint. Not a convenient option, if you want to use the internet.

However, there's a solution.

[EMR Australia can now provide wired-only modem/routers and the equipment you need to establish wired connections to your devices. And we can help you configure it.](#)

[If you're interested in finding out how out more, you can email us requesting a copy of our 'NBN Access Form'.](#)

A wired-only network is the best way to protect against the presence of 5G and subsequent generations of wireless technology inside your home.

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# Free radical damage—what can you do

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Electromagnetic fields (EMFs) can damage the body—  
but there are ways to protect your home and your family.

Electromagnetic fields are present in every home and building, to some extent or other. They are generated by powerlines, meter boxes, electrical wiring, transformers, electrical appliances and sometimes by conductive pipes. Higher frequency electromagnetic fields, also called radiofrequency radiation, are emitted by all wireless devices: mobile and cordless phones, phone towers, modems, tablets, baby monitors, microwave ovens, as well as smart devices such as TVs and electricity meters.

In short, we're surrounded by them.

Exposure to these fields, even at levels present in many homes, been linked with childhood leukemia, brain tumours and sperm damage and the International Agency for Research on Cancer (IARC) has classified these fields as possible carcinogens. Other problems linked to exposure include headaches, sleep problems, concentration and memory problems, digestive problems, pain, heart palpitations and irritability.<sup>1</sup>

Electromagnetic fields damage the body by triggering oxidative stress. This is generated during the process of converting food to energy and results in the production of free radicals. Exposure to EMFs also reduces levels of glutathione, catalase and superoxide dismutase—three components of the body's defence system that protect against free radical damage.<sup>2</sup>

Oxidative stress causes a range of harmful effects on the body, including damage to cell membranes, changes to enzymes and gene expression and DNA damage, which, in sperm, may lead to infertility. It can cause the death of neurons, leading to neurological disorders such as Alzheimer's disease, spinal cord injury, multiple sclerosis and epilepsy. It can also cause sleep disorders, atherosclerosis, loss of appetite, diabetes, dizziness, rheumatoid arthritis, cardiovascular disease, nausea and stroke.<sup>2</sup>

So taking action to protect against free radical damage from EMFs makes sense.

Here's what you can do.

Firstly, you can reduce the levels of electromagnetic fields and radiofrequency radiation in your home. The only reliable way to do that is to measure your home to find out what fields are actually present. (It's not just the sources that you can see that generate them.) You can do that by hiring our Home Test Kit (<http://www.emraustralia.com.au/shop/meters-testing/home-office-test-kit-hire-1>) or talk to us about having your home measured by a consultant.

Secondly, you can reduce your personal exposure to EMFs. Don't hold a mobile phone or other wireless device against your body, use a shielded mobile phone case or wear our protective shielding singlets.



Thirdly, you can help counteract the harmful effects of EMF exposure by taking antioxidants. Several studies have shown that the detrimental effects of oxidation were prevented by taking antioxidants such as vitamin E, vitamin B9 (folic acid and folate) and melatonin.<sup>2</sup>

Precautions like these may make a great difference to how you feel. Why not give them a try?

1. McLean, Lyn 'The Force', Melb, Scribe, 2015.

2. Kivrak, E.G. 'Effects of electromagnetic fields exposure on the antioxidant defense system', *J Microscopy Ultrastructure* Jul 23, 2017.)

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*'Free radicals cause a range of harmful effects on the body, including damage to the cell membranes, changes to enzymes and gene expression, DNA damage which, in sperm may lead to infertility.'*

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## IARC to review RF

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The International Agency for Research on Cancer (IARC) has decided to review the evidence for carcinogenicity of radiofrequency radiation. At a meeting on March, 29 scientists from 18 countries identified these fields as one of the priority issues to be considered during 2020-2024. A report will be released once the review has been completed.

In 2011 IARC classified radiofrequency radiation as a Class 2B (possible) carcinogen and further evidence of carcinogenicity has been found since that time. <https://www.thelancet.com/action/showPdf?pii=S1470-2045%2819%2930246-3>

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## 5G update—Geneva

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Swiss parliamentarians have called for a moratorium on the rollout of 5G technologies. MPs from Geneva voted 58 to 29 in favour of asking the World Health Organisation to conduct independent scientific studies on the effects of radiation from 5G frequencies.

'The environment will be increasingly loaded with magnetic waves, and no one knows if their accumulation is harmful to health', said signatory Bertrand Buchs.

*Le Temps*, 11.04.2019.

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## 5G update—Vaud

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The Swiss canton of Vaud had adopted a resolution calling for a moratorium on the installation of 5G antennas until it receives the results of a study by the Federal Office for the Environment (FOEN).

In speaking to the motion, Greens politician Raphael Maham said that renowned scientists have issued warnings about the health risks of 5G.

The moratorium was approved by 95 votes to 9. *Le Temps*, 09.04.19.

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## Screen time linked to behaviour problems

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Spending two hours or more of screen time per day is linked to clinically significant behavioural problems in pre-schoolers, according to new research from Canada.

The study analysed data from more than 2400 families who recorded children's daily screen time, including watching TV and DVDs, and using computers, video consoles, smartphones and tablets.

It found that, on average, three-year-old children spent 1.5 hours of screen time per day and five-year-olds spent 1.4 hours of screen time per day. Many children spent more than Canada's recommended two hours per day using screens.

"We found that screen time had a significant impact at five years of age," said Piush Mandhane, an associate professor of pediatrics in the University of Alberta's Faculty of Medicine & Dentistry who led the study.

Compared with children who had less than 30 minutes per day of screen time, children who were exposed to more than two hours of screen time per day were five times more likely to exhibit clinically significant "externalising" behavioural problems such as inattention, acting out, hyperactivity and being oppositional; and over seven times more likely to meet the criteria for attention deficit hyperactivity disorder.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213995>

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## Mobile phones—brain damage

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Mobile phone radiation had a harmful effect on the brains of rats in an study conducted in Turkey.

Researchers exposed rats to radiofrequency radiation at different frequencies (900 MHz, 1800 MHz, 2100 MHz) for two hours a day for six months. Compared to unexposed rats, the brains of exposed rats had more damage.

The researchers concluded that mobile phone radiation 'may cause oxidative damage, induce increase in lipid peroxidation, and increase oxidative DNA damage ...in the frontal lobe of the rat brain.' They also said it could cause DNA breaks.

Alkis, ME et al, *Electromagn Biol Med* 38 10:32-47, 2019.

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## Mobiles and headaches

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Turkish scientists investigated the impacts of heavy use of smart phones on 124 migraine patients in a Neurology Clinic of a private hospital.

The found that overuse of smart phones was related to poor quality of sleep and daytime tiredness. They also found that the greater the use of smart phones, the less the quality of sleep and the poorer quality of life the patients reported.

Demir YP and Sumer MM, *Neurosciences (Riyadh)* 24(2):115-121, Apr 2019.

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## Mobiles and thyroid

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A new review by Iranian researchers has found that mobile phone radiation can have potentially harmful effects on the thyroid gland and thyroid hormones.

The researchers found evidence that exposure changed levels of T3 and T4 hormones and altered levels of thyroid stimulating hormone. Several studies showed histological changes in the thyroid gland, such as changes to cell volume.

They suggested that mobile phone radiation may impair the thyroid gland's uptake of iodine. Asl, JF et al, *Environ Sci Pollut Res Int*, May 6, 2019.

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## Mobiles and blood

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A review of relevant studies found that mobile phone radiation produced a range of harmful effects on blood cells.

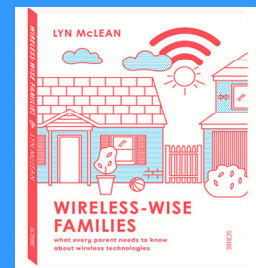
The authors suggested, 'Exposure to EMF result in deterioration of RBCs function and metabolic activity, it was expected that, the increase of toxicity in specific organs was a result of the RBCs functional failure. Therefore, changes in antioxidants may be due to the deterioration in cellular membrane properties in the liver. In addition to increase toxicity in different organs.'

JM Jbireal et al, *Hematology & Transfusion Int J*, 28 Dec, 2018.

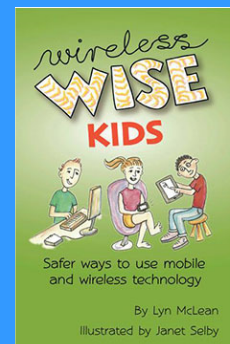
### Books by Lyn McLean



*The Force*



*Wireless-wise Families*



*Wireless-wise Kids*

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

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# Plants are us

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By Diana Crumpler

Marine biologist Monica Gagliano had been conducting research on the Great Barrier Reef. The fish seemed unafraid, swimming in and out of her hands. But come the final day of her project, which required the sacrifice of her subjects, the fish were suddenly wary. It was as if they knew of her intent. Spooked, she vowed not only to never again kill an animal in the name of science, but to change the focus of her research – a quite literal tree change, for she settled on studying sentience in plants.<sup>1</sup>

I first became interested in this field in 2002 when I chanced upon the work of Tony Trewavas while writing “MCS and the molecules of memory”, in which I presented EHS (electromagnetic hypersensitivity) and MCS (multiple chemical sensitivity) as a pathologisation of the long-term memory encoding process underpinned by glutamate, calcium ion channels and protein kinases.<sup>2</sup> Trewavas had demonstrated that plants are not mere vegetables, that they are in fact not only sentient of their environment but also endowed with a memory that allows them to make decisions about how best to respond to that environment.

Even more remarkably, plant and animal kingdoms were found to share the same complex electrochemical signalling language: plant memory is also underpinned by proteins, ion transfer, kinases, and glutamate and calcium channels.

And like human nerve cells, plant cells use changes in voltage across cell membranes to transmit electrical messages from one region to another. Nor does the similarity end there. It was Russian research into the polarity of grafted tomato plants – switching from negative to positive at the site of the wound and then back to negative as healing progressed – that led Dr Robert Becker to the discovery that animals are similarly polarised, and thence to his landmark research into limb regeneration in amphibians and bone healing in humans.<sup>3</sup>

In a series of experiments elegant in their simplicity yet profound in implication, Gagliano has fine-tuned our understanding of plant sentience. Plant memory, she tells us, is not stored in a single-organ equivalent of the mammalian brain but is decentralised throughout the entire plant<sup>4</sup> (which makes good sense given that most plants are being continually eaten and regenerating). Even so, once formed, plant memories are like our own then stored as distinctive electrochemical patterns.

To test a plant’s ability to learn, Gagliano chose mimosa, sensitive plants that close their leaves when confronted with a perceived threat. When first she dropped potted mimosa 15 cm to land on foam, the plants instinctively closed their leaves. Yet after only two to six drops the quickest had already learned that there was nothing to fear; moreover, memories proved to be long-term, still intact after four weeks of non-dropping.<sup>5</sup>

Plants also possess human-equivalent sensory faculties. For hearing, read the ability to detect mechanical vibration. For sight, the ability to distinguish the colour of light (i.e. its frequency) and of surrounding vegetation and objects (via reflected light). For taste-cum-smell, substitute the ability to recognise emanations and secretions from herbivores and volatile aromatics that signal the presence of other plants. That plants also perceive touch has long been known from species that close their leaves when touched.<sup>6</sup>

In humans, specialised sensory organs act as transducers, converting mechanical and other sensory input to bioelectrical signals; these signals are then relayed to the brain, where they are decoded to produce a representation of the outer world. With plants, the process of perception is similar: environmental cues are converted to distinctive electrical signals that the

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*‘Plants ... are also able to detect electromagnetic frequencies other than visible light.’*

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plant then recognises. And, just as our own organs emit bioelectrical signals, flowers emit electrical signals that, in their case, act in concert with other cues to attract pollinating insects.

Plants, it would appear, are also able to detect electromagnetic frequencies other than visible light. The direction of plant growth is not random but premeditated. Peas planted in an inverted Y-shaped tube had two choices when the roots reached the junction. Damp soil versus dry results were predictable. Every plant grew towards the moisture. Next choice was dry versus dry with water circulating through a coiled pipe at the base of one branch. The plants chose the latter option. The presumption was that their acoustic sense allowed the peas to respond to the sound of running water. Yet when challenged with a recording of running water, via a speaker at the base of one of the arms, the plants grew away from it. In fact, they avoided all recorded sounds, everything from running water to white noise to no sound at all, albeit the MP3 player still running.<sup>7</sup>

*Accident or design? This eucalypt once grew atop a mullock heap. When the mullock was removed, the tree was cut down. Above original ground level the tree regenerated with multi-trunks while the now exposed root system was buttressed and stabilised in a way that would not shame a human structural engineer. Did the tree direct its own root growth in a manner best suited to survival?*



As finely tuned bioelectrical organisms, plants are also being harmed by the electromagnetic smog now ubiquitous in our environment. There are numerous examples of damage to trees in line of sight of mobile phone masts. Damage includes irregular leaf colouration, leaf wilt and loss, changes in branching patterns, fewer shoots, dead limbs, and eventual death of the tree. Similar damage has been observed from speed camera radar units. Water-loving trees such as willows appear especially vulnerable<sup>8</sup> (perhaps because wet ground increases electrical conductivity).

Electrohypersensitives the world over are dreading the advent of 5G, its frequency so high, its wavelength so short that it will penetrate all conventional shielding. Potentially

## Mobile phone protection

Blocsock mobile phone

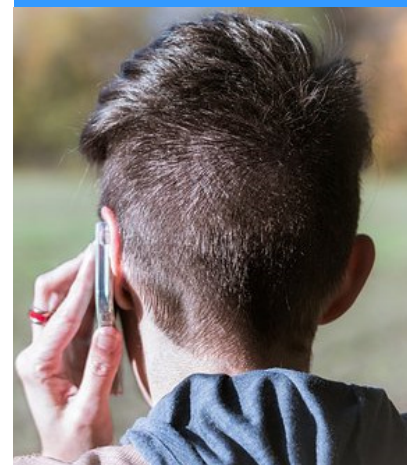


pouches block 96% radiation



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

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drastic though its mammalian consequences may be, Professor Martin Pall anticipates even worse for plants.<sup>9</sup> (Pall is a molecular biologist whose interest in MCS and EHS led him to address the wider ramifications of EMR exposure).

Apologists for industry claim that effects from 5G radiation will be minimal because it is mostly absorbed in the outer 1-2 mm of an organism. Even if such claims were unequivocal – and they most certainly are not – those with higher surface-area-to-volume ratios – plants in particular, with their thin leaves, often fragile structure and exposed reproductive organs – will be most at risk. Hence Pall's prediction that "...there will be major ecological disasters as a consequence of 5G."

Wider scientific awareness and acceptance of plant sentience must ultimately lead to a reassessment of our understanding of evolution, while recognising plants as bioelectrical entities sentient of and adversely impacted by man-made electromagnetic fields must have ramifications for their similarity endowed and afflicted human counterparts. Effects on plants cannot be attributed to putative psychiatric problems or the nocebo effect, as electrosensitive individuals are continually being told!

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See 1 above.  
Ibid.  
Gagliano, Monica et al, eds. *The language of plants*. Minnesota, University of Minnesota Press, 2017.  
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"Tree sensitivity to mobile phone radiation." *ElectroSensitivity Uk*, Winter 2017-18.  
Pall, Martin L. "5G: Great risk for EU, US and international health! Compelling evidence for eight distinct types of great harm caused by electromagnetic field (EMF) exposures and the mechanism that causes them." <http://tinycurl.com/ycmeeeekb>

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## Telstra warned

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The Australian Communications and Media Authority (ACMA) has issued Telstra with a warning for breaching the regulations of the industry code for the siting of mobile phone base stations.

According to ACMA, Telstra breached clauses 6.2.6, 6.4.4 and 11.3.1 of the Mobile Phone Base Station Deployment Code (C564:2011). The carrier contravened the code by:

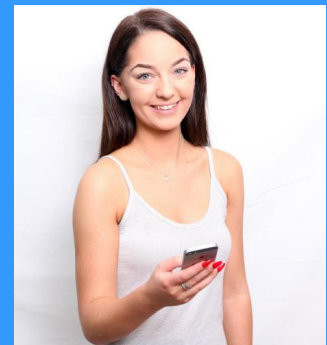
- not fully complying with its consultation plan, which required Telstra to contact residents in the immediate vicinity of the base station
- not sending a letter containing the information to all interested and affected parties; and
- not acknowledging a written complaint within 10 business days of its receipt.

Media release, <https://www.acma.gov.au/theACMA/telstra-fails-to-consult-community>

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Head protection



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