

# EMR and Health

Report on electromagnetic radiation, health and well-being

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## Electromagnetic fields and miscarriage

### Iranian scientists find link between high fields and miscarriage

In a study published late last year, researchers from Iran found that pregnant women who were exposed to high electromagnetic fields (EMFs) had a higher-than-normal risk of miscarriage.

The authors reviewed previous studies that were conducted on miscarriage and exposure to mobile phones and magnetic fields of the sorts emitted by power lines and wiring.

'The present meta-analysis study showed that the risk of miscarriage in pregnant women who were exposed to EMF was 1.69 times higher than the risk for women who were not exposed,' they concluded.

They found that miscarriage risks were affected by:

- the mother's distance from the wireless source and the frequency of its signal
- the length of the exposure
- the strength of the exposure (double



the risk was found at a magnetic field of 16 milliGauss)

- daily time spent using a mobile phone and where the phone was positioned on the body
- the period of pregnancy (risks were higher in early pregnancy).

EMFs could also damage the growth and health of the foetus, the study found.

The authors suggested a number of ways in which EMFs could cause miscarriages. '... EMF may affect chemical interactions in cell membranes; they may decrease the permeability of cell membranes, which results in decreased cell connections; they may increase the number of free radicals in the body; they can impair mitotic divisions; and EMF may damage cell proteins and cause cell severance. Another theory is that the depth of penetration by EMF into tissues increases when fluids are low.'

*(Continued on page 2)*

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The authors say their findings could be used to help prevent miscarriages in the future. 'It is hoped that the results of this study will increase awareness of healthcare providers, such as gynaecologists and midwives, about the adverse effects of electromagnetic waves on pregnancy and the risk of miscarriage. In this way, pregnant women will be encouraged to protect themselves from exposure to electromagnetic waves. Pre-pregnancy and early pregnancy counseling on the proper way to limit exposure to electromagnetic waves from electrical appliances and devices, mobile phones and the internet may reduce the risk of spontaneous abortions,' they wrote.

Irani M, Aradmehr M, Ghorbani M, Baghani R. Electromagnetic Field Exposure and Abortion in Pregnant Women: A Systematic Review and Meta-Analysis. *Malays J Med Sci.* 2023 Oct;30(5):70-80. doi: 10.21315/mjms2023.30.5.6. [Epub 2023 Oct 30. PMID: 37928787; PMCID: PMC10624444.](#)

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## 4G radiation affects testes

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With the amount of mobile phone use escalating dramatically worldwide, researchers from India were interested to learn more about the effects of 4G mobile phone signals on the body.

For their study, the team exposed male rats to 4G mobile phone radiation (2350 MHz) for two hours a day for 56 days and subsequently analysed the effects and compared them to unexposed rats.

They found that exposure had harmful effects on the reproductive system, including:

- reduced sperm viability
- changes to sperm count
- higher levels of sperm abnormalities
- reduced mitochondrial activity in sperm
- reduced levels of testosterone
- decreased antioxidant capacity of the testes
- and physical changes to the testes.

'The results indicate that 4G radiation increases oxidative stress, induces peroxidation of membrane lipids, and decreases total antioxidant capacity in the testis,' the authors said.

These findings have clear implications for infertility, which is on the rise in many countries.

The researchers also tested for effects on the liver, kidneys and blood. They found significant effects on some blood and liver function parameters, but not significant changes in kidney function.

'Thus, it may be concluded that 4G radiation (Carrier frequency 2350 MHz) can affect the reproductive, renal, and hepatic system of male Wistar rat,' the authors concluded.

They recommended that further studies be conducted to expand understanding of the effects of 4G radiation.

Gautam R, Pardhiya S, Nirala JP, Sarsaiya P, Rajamani P. Effects of 4G mobile phone radiation exposure on reproductive, hepatic, renal, and hematological parameters of male Wistar rat. *Environ Sci Pollut Res Int.* 2023 Dec 16. doi: 10.1007/s11356-023-31367-x. PMID: 38102429.

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## 5G radiation affects gut health

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It's well-known that gut health is important for health and mood? When gut problems occur, they can trigger physical symptoms and emotional problems such as depression and anxiety. And, because the gut communicates with the brain, they can even affect the way we think.\*



Now scientists have found new evidence that gut health can be affected by wireless radiation.

In a study published recently, researchers from China investigated the effects of long-term exposure to a 4.9 GHz wireless signal, chosen because it's one of the frequencies used in 5G.

The researchers exposed a group of adult mice to the wireless signal for one hour a day for three weeks and studied the animals' faecal deposits to see whether exposure had affected their intestinal microbiota, comparing them to unexposed mice.

They found it had.

'Our results showed the gut microbial diversity decreased and the microbial composition structure altered after RF [radiofrequency ie wireless] exposure', the authors said.

In their paper, the authors explain just why this is important. 'The gut microbiota plays a vital role in human health. Many studies have shown that the gut microbiota influences not only gastrointestinal function but also central nervous system physiology and behavior by regulating the microbiota-gut-brain axis.' Further, '[a]ccumulating evidence suggests that the gut microbiota may influence neurodevelopment and social behavioral programming in different animal species.'

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*'studies have shown that the gut microbiota influences not only gastrointestinal function but also central nervous system physiology and behavior by regulating the microbiota-gut-brain axis'*

The authors also make interesting observations about wireless radiation and depression.

Previous research has shown that depression-like behaviour could be induced by exposure to a 4.9 GHz signal and, separately, that it is related to different bacteria and different microbial metabolites. So, could the radiation affect the gut microbiota, thus causing the depression?

Possibly.

'Further investigation is needed to reveal the mechanisms of the RF exposure on gut microorganisms and determine the biological significance of the observed phenomena,' the authors wrote.

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Wang, X., Zhou, G., Lin, J. et al. Effects of radiofrequency field from 5G communication on fecal microbiome and metabolome profiles in mice. Sci Rep 14, 3571 (2024). <https://doi.org/10.1038/s41598-024-53842-2>

\* The Brain-Gut Connection', <https://www.hopkinsmedicine.org/health/wellness-and-prevention/the-brain-gut-connection>

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## Exposure affects brain and nervous system

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Many people experience headaches, sleep problems, memory and concentration problems when exposed to electromagnetic fields.

A new study helps explain why.

In a paper published late last year, Drs Dominique Belpomme and Philippe Irigaray describe a condition they call Combined Neurological Syndrome that comprises two types of environmental sensitivity – Electromagnetic Hypersensitivity (EHS) and Multiple Chemical Sensitivity (MCS).

The researchers examined information from 2018 people who had undergone medical tests and face-to-face interviews. Then they compared the neurological (brain and nervous system) symptoms of people with EHS, MCS and EHS plus MCS.

They found ‘no statistically significant difference between the EHS and MCS groups for the frequency of symptoms such as headache, neck stiffness (as confirmed by cervical X-rays in all the investigated patients), skin lesions, tremors/vibrations, myalgia, trismus/neuro-muscular contraction, arthralgia, hyperacusis, photophobia, functional ocular impairment, paralytic ictus ..., balance disorder, loss of immediate memory, confusion, fatigue, suicidal ideation, anxiety/panic crisis, emotional behavior, irritability, nausea/abdominal pain, cardiovascular abnormalities and impaired thermoregulation.’

They did find that some symptoms occurred more frequently in people with EHS than those with MCS and people with EHS and MCS tended to have more symptoms than those with EHS only. In other words, chemical sensitivity appeared to make symptoms worse.



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*‘... we strongly suggest that EHS and MCS are objective somatic disorders which cannot be hypothesized to originate from non-EMF-related psychologic or psychiatric causes or from vague, undefined functional impairments.’*

The study also found that more women suffered from EHS and MCS than men.

Why do these symptoms occur?

The authors consider it has to do with the plasticity (changeability) of synapses (nerve cell junctions) in the central nervous system. They suggested that a receptor called N-methyl-D-aspartate (NMDA) might be involved because it can affect synapse plasticity. They also suggested that the limbic system of the brain could be involved.

The study is important because it demonstrates that the conditions are real, not imagined, and are related to exposure. The authors say, ‘We have shown also that both EHS and MCS can be characterized by identical biomarkers detected in the peripheral blood and urine of patients. Therefore, contrary to previous reports, we strongly suggest that EHS and MCS are objective somatic disorders which cannot be hypothesized to originate from non-EMF-related psychologic or psychiatric causes or from vague, undefined functional impairments.’

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Belpomme, D.; Irigaray, P. Combined Neurological Syndrome in Electrohypersensitivity and Multiple Chemical Sensitivity: [A Clinical Study of 2018 Cases. J. Clin. Med. 2023, 12, 7421.](#)

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# Follow the money!

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Why do some scientists tell us 5G is safe while others call for a moratorium on the 5G rollout?

Australian researchers have an answer. In a paper published earlier this month, Stephen Weller and Dr Julie McCredden explain why not all science is equal - and, not surprisingly, it has to do with money.

Weller and McCredden examined the qualifications, funding and affiliations of researchers who had weighed in on the 5G debate. They found that there were broadly two separate camps.

## Precautionary scientists

The first consists of the scientists who recognise the potential risks of exposure and recommend a precautionary approach. They include highly qualified, experienced and respected scientists such as Dr James Lin, Professor Igor Belyaev, Professor Fiorella Belpoggi, Professor Lennart Hardell and Dr Di Ciaula. They are 'predominantly medical experts, epidemiologists, biological scientists and biophysicists, or analysts whose papers conclude that there is evidence for risk of harm,' Weller and McCredden say.

Many of these experts arrived at the view that there could be serious health problems from exposure over a period of time as a result, as a result of evidence they observed. And many of them 'have organized into independent science-based advocacy groups in order that their evidence-based concerns may be heard.'

## No-evidence-of-harm scientists

The other camp consists of scientists who claim there is *no evidence of harm*.

They are 'mostly industry linked and affiliated with regulatory agencies worldwide. They do not advise precaution, do not change their opinions, and they downplay the results of scientists who claim that harm exists,' say Weller and McCredden. Of note, they 'have more expertise in physics or engineering than in biology or biophysics'.

## Industry influence of science

Weller and McCredden explain the incestuous relationship between governments and the telecommunications industry. They say, that:

- the telecommunications industry influences research through funding of universities and research programs
- international advisory bodies, the WHO (EMF project) and ICNIRP (the International Commission on Non-Ionising Radiation Protection) are closely linked to industry
- 'Government advisory agencies are unable to make independent statements about health and exposures, because they are expected to support government plans for comprehensive internet of things (IoT) and smart cities, which are dependent on wireless technologies'
- governments obtain income from the sale of RF spectrum
- the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) financially supports the WHO-EMF.

The Australian team provides examples of techniques used to maintain the *no evidence of harm* narrative in many scientific papers – bias, watering down results and 'repeating the "no conclusive evidence" mantra'.

Unfortunately, they say, 'Authors aligned with ICNIRP and/or the WHO EMF project have the ear of governments worldwide. It is this second industry-linked group that is controlling the official narrative.'

Relevant questions they pose for government authorities are:

- 'Why are government regulatory bodies not heeding the world's independent authorities?
- 'When will industry take responsibility for clear communication of risk?
- 'Why is the public not being educated in how to avoid potential harm?
- 'Why is the precautionary principle not being included within government policies regarding all wireless technologies, including 5G?'

'Denigrating or silencing those scientists who are pointing out the problem is not going to help to solve it. Rather, the input of these scientists as well as the rational public is needed for the courageous problem solving that is urgently required so as to reduce RF-EMF-induced erosion of human and planetary health,' Weller and McCredden conclude.

Weller S and McCredden JE (2024) *Understanding the public voices and researchers speaking into the 5G narrative*. *Front. Public Health* 11:1339513. doi: 10.3389/fpubh.2023.1339513;

Note: A fuller history of the links between industry, government and universities in Australia is given by Dr Don Maisch in *Spin in the Antipodes* ([Chap 16 in Corporate Ties that Bind](#));

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## Social media and depression

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Researchers have found new evidence supporting the link between depression and social media addiction.

The study was conducted by researchers from the University of Mosul in Iraq, via a questionnaire given to 603 university students. It found that, 'there is a significant level of addiction to social media among the students with a high possibility of depression, both related to academic performance and sleep quality.'

The results showed that only a small number of the students (6.3%) used social media for less than an hour a day; the majority (54.1%) used it for 1 to 4 hours a day, while nearly 40% used it for more than 4 hours a day.

According to the authors, 'this study showed that those participants who spent less than 1h on social media would have the lowest addiction and depression scores. In other words, the longer time the students spend on social media, the higher the possibility that their daily life would be affected.'

The study also showed that depression was higher in students who slept for less than six hours a day and in females, although the authors suggested that lifestyle factors may have played a role in the latter.

Nor surprisingly, social media use was also linked to academic performance. Approximately three quarters of the students (73.5%) said that they would expect to achieve better results if they actually stopped using social media.

It's not just students who are at risk of social media addiction. According to the authors, 'Everybody who have [stet] access to internet can suffer from social media addiction without respect to their age, sex or other socio-demographic characteristics.'

Shanshal SA, Al-Qazaz HK, Saadallah DA, Mohammed SY, Saber QAY, Ali MM, Mahmmud WN. Social media addiction and depression and their predictors among university students. *Int J Adolesc Med Health*. 2024 Feb 19. doi: 10.1515/ijamh-2022-0111.

# Less mobiles, more learning

The world-wide trend to getting mobile phones out of schools is growing. Recently, governments in Sweden and Russia announced that they would be introducing bans on mobile phones in schools and implementing them as soon as possible.

## Sweden

Currently, the Education Act allows students to use mobile phones in class in some situations, but students have been exploiting this to bring phones to class unnecessarily.

Now Swedish politicians are calling for the Education Act to be tightened to ensure that primary schools are free of mobile phones – both in the classroom and during breaks. This means that students' mobile phones will be collected in the morning and returned to them at the end of the school day.

Proposed changes to the Act would include allowing principals to provide exemptions to the ban where necessary.<sup>1</sup>

## Russia

Russian politicians have voted to ban the use of mobile phones in classrooms to improve students' learning.

The bill has yet to be approved by the Government's Upper House and President Putin but are nevertheless expected to be implemented this month (January 2024).

The changes are supported by parents and teachers<sup>2</sup>

The Russian National Committee on Non-Ionizing Radiation Protection (RCNIRP) has expressed concerns about children's exposure to mobile phone radiation for many years. In 2008 it released a statement explaining why children are at particular risk of exposure and called on authorities to protect them.

'According to the opinion of the Russian National Committee on Non-Ionizing Radiation Protection, the following health hazards are likely to be faced by the children mobile phone users in the nearest future: disruption of memory, decline of attention, diminishing learning and cognitive abilities, increased irritability, sleep problems, increase in sensitivity to the stress, increased epileptic readiness', the statement said.<sup>3</sup>

Since 2004 it has recommended against the use of mobile phones by children under the age of 16.

Last year, a UNESCO report found that banning mobile phones from schools improves academic performance, especially for low-performing students. It also showed that approximately one in four countries had introduced bans or policies to restrict mobile phone use in schools.<sup>4</sup>

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1. [SVT News](#), 9.12.23,
2. [Moscow Times](#), 6.12.23,
3. '[Decision of Russian National Committee on Non-Ionizing Radiation Protection "CHILDREN AND MOBILE PHONES: THE HEALTH OF THE FOLLOWING GENERATIONS IS IN DANGER"](#)'. Moscow, 14.4.2008,
4. [UNESCO](#). 2023. Global Education Monitoring Report 2023: Technology in education – A tool on whose terms?

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## Modem myths—what you need to know

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Generally, the modem is the highest source of radiation in a home and most people are not aware of it. Many modern modems are extremely high-powered and emit radiofrequency radiation over a very large area.

I speak to lots of people who think their modems are radiation-free when they're not, so today I'd like to share some of the common misconceptions I encounter and let you know what you can do about them.

### Misconception 1

*My modem is safe because I turn off the WiFi button on the modem.*

This doesn't usually turn off the radiation that the modem emits.

### Misconception 2

*My modem is safe because it's connected to my equipment with wires.*

Doing this doesn't stop the radiation because modems will still broadcast a wireless signal when devices are connected by cables.

### Misconception 3

*My modem isn't a problem because I turn it off at night.*

That means your modem is only safe when no one's using it!

### Misconception 4

*My modem is safe because the wireless function has been turned off in the settings.*

This may stop the modem from emitting radiation temporarily, however, future updates to software/firmware and modem resets can turn on the wireless function again without you even knowing.

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*'you don't need wireless  
equipment to have internet  
access or a landline phone'*

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