

# EMR and Health

Quarterly report on electromagnetic radiation, health and well-being

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## Legal liability

**A ground-breaking Australian seminar considers the legal implications of EMR-related injuries.**

The Australian legal community is expressing interest in the link between electromagnetic radiation and injury, in light of a number of international compensation claims and increasing scientific evidence linking adverse effects to exposure.

On Wednesday 14th October, the Faculty of Law at the University of NSW hosted an educational seminar entitled 'Wireless Devices: Risk, Regulation, Compliance and Liability.' Its speakers discussed legal and scientific developments that are of significance to all employers, schools, industries and governments, as well as individuals exposed to wireless radiation.

'It was an experiment that worked,' said Dr Karin Lemercier from the UNSW Faculty of Law and one of the organisers of the event. 'We brought together scientists and lawyers. We asked three scientists and an electrical engineer to summarise the present knowledge about the biological and possible health effects of exposure to non-ionising radiation. Then we asked three partners from law firms to summarise the regulatory framework and the statutory and common law that would be relevant in a work health and safety matter. Finally, the lawyers considered a case that had just been filed in USA in which an 11 year old boy became sick after new WiFi was installed in his classroom. The facts could apply to any

workplace. Each person had studied the case. The lawyers asked the expert witnesses for their evidence. It was a real life 'Hypothetical'. No one left before the end of the 4 hour session!!!'

The meeting was hosted by Robyn Williams AM, from the ABC's Science Unit. He told the audience that he does not own a mobile phone and has no intention of doing so. However, he does have a wooden model of a phone that he's able to take to restaurants and other public places so as to blend in with other phone users!

The general consensus of the speakers was that Australian standards, which protect primarily against short-term, acute, heating effects of radiation are not adequate and that better standards are required.

The seminar comes in the wake of the International Appeal in which scientists from 39 nations called on the United Nations and World Health Organisation to recognise the inadequacy of international radiation guidelines and take actions that will ultimately benefit the public.

*(Continued on page 8)*



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**The Oceania Radiofrequency Scientific Advisory Association (ORSAA) has been established—details, p 7.**

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# Israel's activities

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Israel is implementing strong precautions to measure and reduce public exposure to electromagnetic radiation. Its National Activity Report 2015 advises that:

- magnetic fields were measured in 4800 schools and action was taken to reduce fields in locations that measured more than 4 milliGauss [Australian limits allow exposure to 1000 mG];
- ten types of mobile phones were measured for SAR [Specific Absorption Rate] and results showed that, when phones were held close to the head and in poor reception areas, some measurements exceeded those declared by the manufacturer;
- an educational program has been developed to show teenagers how to use mobile phones more appropriately;
- mobile phone companies are required to provide buyers with safety information and a free and economical hands-free kit;
- guidelines have been developed to reduce exposure to wireless radiation in schools, including limiting its hours of use, installing low-exposure equipment and monitoring radiation levels;
- the government has approved a design for substations with low fields;
- fourteen RF monitoring stations have been installed which record and analyse radiation levels in a given area;
- an educational website ([www.tnuda.org.il](http://www.tnuda.org.il)) has been developed and will be translated into English.

The report can be found at: [http://www.who.int/peh-emf/project/mapnatreps/ISRAEL\\_2015.pdf?ua=1](http://www.who.int/peh-emf/project/mapnatreps/ISRAEL_2015.pdf?ua=1)

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# Berkeley introduces mobile phone label

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Following a judgment in the Californian District Court, the City of Berkeley will become the first in the US to successfully introduce labelling for mobile phones.

On 21 September, Judge Edward Chen pronounced his decision in a legal battle between Berkeley, whose councillors voted for the labels in May, and the CTIA Wireless Association, which claimed that the labels violated the First Amendment.

The Berkeley ordinance required that the specific information should be provided to every person who either purchases or leases a mobile phone or should be prominently displayed at the point of sale or lease. The text was to read: 'If you carry or use your phone in a pants or shirt pocket or tucked into a bra when the phone is ON and connected to a wireless network, you may exceed the federal guidelines for exposure to RF radiation. This potential risk is greater for children.'

Council for Berkeley argued that manufacturers advise against holding mobile phones directly against the body, yet consumers are generally unaware of these recommendations. 'It is much more common for cell phones to be carried in pockets or other locations rather than holsters or belt clips, resulting in much smaller separation distances than the safety recommendations specify,' the City's municipal code states.

Before introducing the ordinance, Berkeley City Council conducted a telephone survey about mobile phones. It found that 70 percent of respondents were not aware that Federal radiation testing protects only when phones are held one to 15 millimetres from the body and not when held directly against the body.

Judge Chen found that the reference to greater risk for children was scientifically controversial and ruled that it should be omitted from the ordinance. However, he did not grant the CTIA's injunction against the phone labels themselves.

(CTIA – The Wireless Association®, v The City of Berkeley, Northern District of California Court, Case3:15-cv-02529-EMC Document53,Filed09/21/15)

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*"If you carry or use your phone in a pants or shirt pocket or tucked into a bra when the phone is ON and connected to a wireless network, you may exceed the federal guidelines for exposure to RF radiation"*

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# Microwave symptoms explained

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There is both enough evidence to say that microwave radiation causes a range of symptoms in humans and a mechanism to explain how this happens. This is the conclusion of an important new paper, published in August, by Professor Martin Pall from Washington State University.

Professor Pall argues that microwave radiation activates voltage-gated calcium channels in the cell membrane that allow the passage of calcium. This causes calcium to flood into the cell, leading ultimately to the production of nitric oxide, peroxynitrite and free radicals that cause oxidative stress. As evidence, he cites 26 studies which showed that agents that block calcium channels either prevented or limited the effects of EMR exposure.

These effects occur at levels far below international standards. Whereas these standards are based on the assumption that only the heating (thermal) effects of radiation are problematic, the effects that Pall documents occurred at athermal (below-heating) levels of exposure.

Pall says that voltage-gated calcium channels are extremely prevalent in the nervous system, where they are involved in the release of neurotransmitters and neuroendocrine hormones. Significantly, the nervous system is also the system that has been shown to be most vulnerable to microwave exposure. Many studies published in Russia during the 1950s and 60s showed that athermal exposures resulted in changes in the bodies of rats, mostly within the nervous system. They also showed that pulsed signals produced more changes than unpulsed signals.

Pall describes the symptoms resulting from disorders of the nervous system as neuropsychiatric symptoms. They include sleep disturbance and insomnia; headaches; fatigue/depression/dysfunctions of vision, hearing and smell; concentration and cognitive problems/dizziness and vertigo; memory changes, restlessness, tension, anxiety, stress; irritability; loss of appetite or weight; skin tingling or burning and nausea.

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*“numerous studies ...have shown that people exposed to microwave radiation developed neuropsychiatric symptoms”*

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He cites numerous studies which have shown that people exposed to microwave radiation developed neuropsychiatric symptoms, including two US Government reports and one by the US Air Force.

But is the connection between these symptoms and exposure sufficient for the exposure to be said to have caused them? Pall says it is. He lists five criteria that are required to prove a cause and effect relationship and demonstrates that the evidence supports them all. (Pall, ML, 'Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric symptoms, including depression,' *J Chem Neuroanat* Aug 21, 2015.) [See more research from Martin Pall on page 6.]

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## Precautions in US schools

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Following a lawsuit against a school for exposing a student to wireless radiation, Ashland District has become the first in the US to introduce guidelines for reducing students' exposure to wireless radiation. On August 25, the District implemented 'Best Practices for Mobile Devices', which states:

- “Turn off the device when not in use.
- Turn wifi On only when needed.
- Always place the mobile device on a solid surface.
- Viewing distance should be a minimum of 12 inches [30 cm] from the screen.
- Specific product information guides are available by request through the IT Department.
- All classrooms will have best practices posted.
- Please contact the IT Department if you have any questions or need any assistance with any mobile device or in implementing the best practices.
- We ask that staff members regularly remind and instruct students in using best practices in regards to mobile devices.”

(<http://www.digitaljournal.com/pr/2688700>)

# RESEARCH UPDATES

## ELF fields (from electrical sources)

### Genes

Scientists from China investigated the genetic impact of magnetic fields from electrical sources on mouse sperm cells. They showed that exposure affected DNA methylation (which controls gene expression). (Liu, Y et al, *Biomed Res Int*, 2015.)

### Cells

Researchers from Korea investigated the effects of power-frequency magnetic fields on several different cell lines. They found that some exposed cell lines had reduced numbers, viability and rates of DNA synthesis and concluded that exposure could delay cell cycle progression. (Lee, HC et al, *Bioelectromagnetics* 36(7):506-16, 2015.)

## RF/wireless radiation

### Heart

WiFi radiation had harmful effects on the cardiovascular system in a study from Algeria. Scientists exposed albino rabbits to a 2.45 GHz WiFi signal emitted from an antenna located close to the heart. They found that exposure affected heart variability and blood pressure and adrenal hormones dopamine and epinephrine, which affect the cardiovascular system. (Saili, L et al, *Environ Toxicol Pharmacol* 40(2):600-5, Sept, 2015.)

### Prenatal exposure

Prenatal exposure to mobile phone radiation could affect offspring, according to research from Turkey. Scientists exposed pregnant rats to a 900 MHz wireless signal for one hour a day for nine days. They found that their offspring had lower numbers of Purkinje cells (neurons)

and pathological changes in these cells. This showed that exposure affects the cerebellum of the newborn. (Odaci, E et al, *J Chem Neuroanat*, Sept 21, 2015.)

### Speech problems

Another prenatal study, this time on humans, investigated whether maternal exposure to electromagnetic fields affected the speech of the unborn child. Iranian scientists asked mothers of children with and without speech problems about their exposure to electromagnetic fields from different sources during pregnancy. They found a link between speech problems and mothers' use of mobile phones while pregnant. (Zarei, S et al, *J Biomed Phys Eng*, 5(3), 151-4, Sep 2015.)

### Male fertility

Use of wireless internet could be damaging male fertility. Turkish scientists analysed the semen of approximately 1000 men with fertility problems and questioned them about their use of mobile phones and wireless internet. They found that sperm motility decreased with greater use of wireless internet and wireless internet users had less motile sperm than wired internet users or mobile phone users. (Yildirim, ME et al, *Kaohsiung J Med Sci*, 31(9):480-4, 2015.)

### Sperm

Some aspects of mobile phone use can adversely affect sperm, say scientists from Israel. The researchers questioned 106 men referred for semen analysis about their mobile phone use. They found that talking on a mobile phone while charging it was linked with abnormal sperm concentration in semen. (Zilberlicht, A et al, *Reprod Biomed Online*, 31(3):421-6, 2015.)

### Immunity

Mobile phone radiation had a harmful effect on human immune cells. Scientists exposed blood samples from 13 healthy volunteers to a mobile phone signal of 900 MHz for two hours. Exposed samples



*A selection of studies showing effects of exposure*

## Abbreviations

RF radiofrequency radiation (including mobile technology)

ELF extra-low frequency radiation (including electrical sources)

EMF electromagnetic fields (often used alternatively for ELF)

mG milliGauss (measurement of magnetic field)

T Tesla - alternative measurement of magnetic field; also milliTesla (mT) and microTesla ( $\mu$ T)

0.1 mT = 1000 mG

0.01 mT = 100 mG

1  $\mu$ T = 10 mG

Hz Hertz - a measure of frequency (cycles per second).

Megahertz (MHz) - million Hz

GigaHertz (GHz) thousand million hertz

showed increased oxidation. (Kazemi, E et al, *J Biomed Phys Eng* 5(3), 105-14, Sept, 2015.)

### Oxidation

Turkish scientists reviewed studies on the radiation from mobile phones and similar devices and oxidation. The review found that exposure caused oxidative stress—which can be linked to a wide range of adverse effects on the body. (Dasdag, S and Akdag, MZ, *J Chem Neuroanat*, Sept 12, 2015.)

### Prenatal exposure

Pregnant rats were exposed to a 950 MHz mobile phone signal throughout pregnancy and for six days afterwards. They were found to produce offspring with reduced weight, lower blood glucose levels and more carbonyl proteins in the brain cortex. (Furtado-Filho, OV et al, *Int J Radiat Biol*, 2015, *in press.*)

### Children

Children should be protected from wireless radiation, say collaborators from Russia and the US. The referred to children's heavy use of phones and early adoption of the devices and the strength of signals emitted by smart phones. The authors encouraged application of the precautionary approach to exposure. (Markov, M and Grigoriev, Y, *Electromagn Biol Med* 34(3):251-6, 2015.)

## Electromagnetic hypersensitivity

### Diagnosing EHS

Dr Dominique Belpomme has conducted tests on 521 people with electromagnetic hypersensitivity (EHS), 52 with multiple chemical sensitivity (MCS) and 154 with both conditions. He found:

- increased levels of histamine, indicating chronic inflammation (40% of subjects);
- indications of opening of the blood-brain barrier in some subjects;
- indications of autoimmune response;
- increases in some stress proteins;
- decreased melatonin levels in all

subjects;

- changes to brain blood flow in the temporal lobes indicating inflammation involves the limbic system and thalamus.

'Our data strongly suggest that EHS and MCS can be objectively characterized and routinely diagnosed by commercially available simple tests,' the authors said. (Belpomme, D et al, *Rev Environ Health*, 30 (4):251-71, Dec 2015.)

### EHS is real

Electromagnetic hypersensitivity is related to EMF exposure and should be listed in the International Classification of Diseases, say authors of a new paper. The scientists reviewed literature on EHS and found symptoms among Soviet radar workers, Swedes using cathode ray computers and other people with EHS. The authors expressed particular concern about the effects of the long-term exposure of children at schools. (Hedendahl, L et al, *Rev Environ Health*, Sept 15, 2015.)

### Not nocebo

Electromagnetic hypersensitivity is unlikely to be caused by the nocebo effect, according to new research from France. M Dieudonné questioned the hypothesis that electromagnetic hypersensitivity is caused by the nocebo effect—the suggestion that exposure could be harmful—a view taken by Australian and other authorities. She interviewed 40 EHS volunteers and found that symptoms occurred before they became aware of the potential for EMF to affect their health—a result that is inconsistent with a nocebo effect. (Dieudonné M, *Bioelectromagnetics*, Sept 15, 2015.)

### Causes

Information from the Earth's electromagnetic field is essential for human health and behaviour. When this field is swamped with artificial electromagnetic fields, the result can be 'devastating' biological effects that disrupt health when the body's adaptive processes fail to cope. Electromagnetic hypersensitivity occurs when a person is exposed chronically or successively and effects on voltage-gated calcium channels may explain this condition. (Sage, C, *Rev Environ Health*, Sept 12, 2015.)

*'Use of wireless internet could be damaging male fertility'*



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*'The review found that exposure caused oxidative stress'*

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# Not-so-smart meters: report

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The Victorian smart meter rollout has been a costly exercise that has substantially failed to deliver anticipated results. This is the conclusion of the September report of the Victorian Auditor-General, John Doyle.

Since 2009, the average household has paid approximately \$760 in metering charges which have not been itemised on electricity bills. These costs may reduce in the short term but are expected to increase 'sharply' from 2024 when the meters are due to be replaced. State costs may exceed the 2011 estimate of \$319 million and are even higher than for manual reading of electricity meters.

While it's possible that about 80 percent of expected benefits may be realised in time, this may not be the case, as this calculation is based on 'complex assumptions' that are not being met.

'Market research conducted in early 2014 found that two-thirds of Victorians did not understand what the benefits of smart meters were and many were still unaware of the link between their smart meter and saving money on their electricity bills,' the report stated.

Although consumers have paid for the smart meter rollout, they have not been kept informed about it. 'There is little clear and transparent knowledge of costs to consumers to date and no public reporting of either the costs or benefits of the program,' Mr Doyle wrote. ('Realising the Benefits of Smart Meters', Victorian Auditor-General's Report, September 2015.)

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## The next step

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There is abundant evidence that wireless radiation produces nonthermal effects on the body, yet international standards only recognise its thermal effects. This leaves not only individuals unprotected, but also the companies that manufacture wireless products, says Professor Martin Pall, writing in the September issue of the International Journal of Innovative Research in Engineering and Management.

In his paper, Pall documents a large body of scientific evidence for nonthermal effects and the mechanism he has identified whereby EMR activates exquisitely sensitive voltage sensors in the cell membrane which control the opening of voltage gated calcium channels to allow calcium to flood into the cell (see page 3). This mechanism, he said, could explain a wide range of biological symptoms identified in the scientific literature.

Current standards are inadequate, Pall says, because they ignore these nonthermal effects. They also ignore four very important characteristics of wireless radiation that determine how a signal impacts on the body. These are pulsation, polarisation, frequency and windows of effect. 'All of these things .... argue compellingly that we cannot predict biological effects based simply on the intensity of EMFs and certainly not on heating effects of EMFs,' he said.

What's needed, Pall argued, is studies that test how EMF affects cell lines with high levels of voltage gated calcium channels.

He also encouraged industry to take pulsation, polarisation, frequencies and windows of effect into consideration when developing and manufacturing electronic devices. Doing so, could give them a marketing edge, he said.

(Pall, M L, 'How to approach the challenge of minimizing non-thermal health effects of microwave radiation from electrical devices', *IJIREM*, 2(5), Sept 2015.)

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## WiFi concerns

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A retired US physicist has called on libraries and schools to address the risks of wireless radiation. Dr Ronald Powell, who worked for the Executive Office of the President, the National Science Foundation, and the National Institute of Standards and Technology, expressed concerns about the impact of wireless radiation in an open letter of 20 August.

'The vast majority of the thousands of peer-reviewed research publications of this [international biomedical] community, when funded independent of the wireless industries, are finding biological effects of concern. Further, these biological effects occur at levels of radiation far lower than earlier understood. Simply stated, a worldwide health crisis is emerging,' the letter states.

Dr Powell referred to the fact that environmental emissions are increasing exponentially but that most people are unaware of this because of their invisibility. He said that present standards, based only on heating effects of exposure, are 'outdated and overly permissive' and he referred to the influence that the telecommunications industry exerts on both the public and governments.

Libraries and schools can protect people by using wired connections rather than wireless connections, Dr Powell said. (<https://skyvisionsolutions.files.wordpress.com/2015/08/message-to-public-libraries-about-wireless-devices.pdf>;

<https://skyvisionsolutions.files.wordpress.com/2015/08/message-to-public-schools-about-wireless-devices.pdf>)

### Now we are 20

This issue of 'EMR and Health' marks a significant anniversary. Lyn McLean has been producing a quarterly publication on electromagnetic radiation and health for twenty years. —firstly, through the EMR Association of Australia as 'EMR News' and, since 2004, through EMR Australia as 'EMR and Health'.

# UPDATES FROM AROUND THE WORLD

## Italy

On 10 June, the Parliament of South Tyrol voted in favour of precautions to protect people's health. These included replacing public wireless networks with those that emit less radiation; educating the public about the possible risks of wireless technology and establishing a working group to identify safer and sustainable technology options. (<http://kompetenzinitiative.net/KIT/KIT/progress-in-south-tyrol-applying-the-precautionary-principle/>)

## Smart meters

The US City of Naperville is to pay compensation to a resident following a lawsuit involving the installation of smart meters. Malia Bendis, founder of Naperville

Smart Meter Awareness, was arrested by Naperville Police two years ago for protesting the installation of a smart meter. Ms Bendis's claim that her arrest violated her constitutional rights was upheld in a federal court, as a result of which Naperville City Council will pay her US\$117,500 in compensation. (*Naperville Sun*, 15.09.15.)

## Computers in the classroom

The use of technology in schools is not necessarily improving academic performance, according to an OECD report published on 15 September. The report, 'Students, Computers and Learning: Making The Connection', found that

moderate computer use at school slightly improved student performance, but that frequent computer use produced much worse results. ('Students, Computers and Learning: Making the Connection, Andreas Schleicher, (Director, OECD Directorate for Education and Skills), OECD Education.)

## ENA report

Australia's Energetic Networks Association (ENA) is developing a handbook that deals with the fields from electrical sources and possible mitigation strategies.

A draft of the 'ENA EMF Handbook' was open to public comment till October 30. (<http://www.ena.asn.au/electric-and-magnetic-fields>)

## Australasian Association formed

The Oceania Radiofrequency Scientific Advisory Association (ORSAA) has been established to provide independent scientific advice about the impacts of wireless technology. A particular interest will be the impacts of exposure on vulnerable members of the population, such as children, pregnant women, the sick and the elderly.

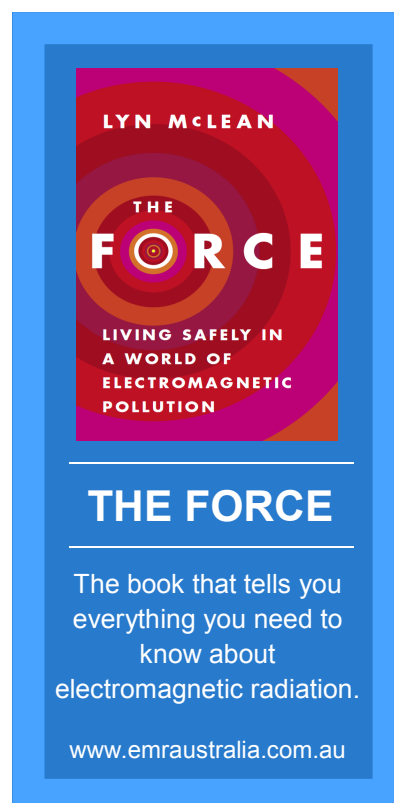
The Association's executive committee is comprised of Dr Julie McCredden (President), a researcher at the University of Queensland; Victor Leach (Secretary), a retired Radiation Health Physicist for 40 years and Steve Weller (Treasurer), community representative on ARPANSA's EMERG committee.

The aims of the new Association are to:

- preserve health and human rights by advancing knowledge and expertise about RF;
- provide education by assembling a body of scientific experts and holding educational seminars;
- promote the establishment of biologically-based RF standards that provide long-term protection for the public;
- promote scientific research on RF radiation;
- assist research objectives that bridge the gap between exposure and disease.

The Association is currently inviting people to become members and a membership form is attached to this publication.

**'The Force': new issue, available mid December, contains updates of news from 2011 to 2015.**



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# Wireless devices: risk, regulation, compliance & liability

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(Continued from page 1)

## Paul Wentworth

Lawyer Mr Paul Wentworth provided an introduction to the Australian legislative framework. The relevant standard, known as RPS 3, was developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). While it claims to protect everybody, including children, 'no safe levels [are] specified for low level, long-term exposure,' he said. As well as the standard, and the Radiocommunications Act 1992 which enforces it, employers also have to comply with Work Health and Safety legislation and with Common law.

Are the current regulations adequate? Mr Wentworth drew the audience's attention to the International Scientists Appeal lodged in May—an appeal to the United Nations and World Health Organisation (WHO) by 206 scientists from 40 countries asking for tighter standards and greater protection. (See *EMR and Health*, June and September, 2015).

## Dr Mary Redmayne

Dr Redmayne, a researcher at Monash University, spoke about international policies relating to the exposure of children and workers to wireless radiation. 'Young people's use of devices has skyrocketed,' she said. 'They are spending more time on them and using them younger.' She showed evidence that exposure does cause effects and that intensive screen use is related to the growing prevalence of myopia.

Different countries take different approaches to standards-setting, Dr Redmayne explained. While the less stringent, such as Australia's, aim to prevent thermal (heating) effects of exposure, the more stringent, such as Russia's, aim to prevent thermal effects along with other biological damage. Dr Redmayne described the Australian approach to radiation exposure—requiring compliance with a thermally-based standard—as a 'red herring' because it doesn't address typical low level, long-term exposures.

She advised that schools develop policies for safer use of wireless technologies and suggested approaches for doing this. 'I recommend that parents and schools minimise their children's exposure to RF-EMR as a precautionary health and safety step,' she said.

## Dr Priyanka Bandara

Dr Bandara, a molecular biologist, discussed research on the biological and health effects of wireless radiation. She said that this radiation, at levels that comply with Australian standards, can damage DNA, cells (nucleus, mitochondria and membranes), the blood-brain barrier, sperm and is linked with neurological symptoms. Moreover, greater effects occur at some 'windows' of exposure (eg ranges of frequencies) than others—a fact not taken into account by thermally-based standards.

'Electricity is essential for the survival of each cell,' she said, 'It should not be a surprise that man-made EMF could interfere with it.'

Dr Bandara referred to the work of Professor Martin Pall (see pages 3 and 6) which shows that exposure activates voltage-gated calcium channels, leading to chemical reactions that can explain the neurological symptoms that are commonly reported among exposed people and are not addressed by the Australian and WHO standards.

'Exposure to microwaves starts from conception,' Dr Bandara said and raised the question of its long-term impacts on children. She referred to studies showing exposure affects the development of the foetus and of children, including behavioural changes such as ADHD and, perhaps, autism.

## Associate Professor Ray Kearney OAM

Professor Kearney, from the Department of Medicine at Sydney University, shared a personal family anecdote. Twenty five years ago his young daughter developed severe and unexplained headaches. On investigation, he found a high magnetic field from a switchboard behind her bed and power cable under the bed that fed it. Once she was moved from this bedroom, her headaches disappeared.

Professor Kearney referred to the United Nations Declaration of Human Rights (1966) including 'The prevention and reduction of the population's exposure to harmful substances such as radiation and harmful chemicals or other detrimental environmental conditions that directly or indirectly impact upon human health'. 'Is Australia in breach of this article?' he asked. 'Emphatically yes.'

Professor Kearney discussed three mechanisms which explain how electromagnetic fields can cause health problems.

The first involves the hormone melatonin which plays important roles in a number of critical body functions. It scavenges free radicals, prevents DNA damage and protects against cancer; it reduces the stress hormone cortisol, plays vital roles in immunity, inhibits 'bad' cholesterol, decreases blood pressure, reduces obesity and sympathetic nerve activity and induces tumour cell suicide.



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# Wireless devices: risk, regulation, compliance & liability

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However, studies show that magnetic fields from electrical sources reduce the production of the antioxidant hormone melatonin and can even damage the melatonin receptor. Ignoring this evidence, he said, is 'wilful blindness to the truth'.

Professor Kearney also discussed the role of mast cells in contributing to hypersensitive reactions. Mast cells can release PAF (Platelet Activating Factor) which is extremely toxic and high levels have been linked to severe anaphylaxis. These cells, triggered by electromagnetic fields, also release histamine, an inflammatory substance that causes redness, itching and pain. Because histamine can impact on every organ and system of the body, it has the potential to cause a wide range of symptoms.

Finally, Professor Kearney referred to the work by Professor Martin Pall which shows that low levels of exposure activate voltage-gated calcium channels, causing oxidative stress.

It is time, he said, 'to acknowledge that levels of EMF that are far, far below the standard will cause biological effects.'

## Jenne Tzavaras

A partner with Ebsworth Lawyers, Jenne specialises in Workers Compensation litigation. She told the audience that workers compensation claims don't require proof that the employer was at fault but do require proof that the injury was *caused* by employment. She discussed the details of the case in which Dr David McDonald was awarded compensation for injury sustained from exposure to electromagnetic fields at work (McDonald and Comcare [2013]AATA—see *EMR & Health*, June, 2013).

## David Anderson

Mr Anderson, a partner at Ebsworth Lawyers, has specialised in defending personal injury claims. He said that, under Common Law, a defendant is liable for damages if his or her negligence made a 'material contribution' to the injury or disease. Establishing liability involves taking into account a number of variables such as the suitability of preventative steps, whether it was possible to foresee that an injury might occur and balancing the various responsibilities of an employer.

Mr Anderson said that the NSW Work Health and Safety Act 2011 requires managers to make the workplace as safe as practicable and imposes penalties for failure to do so.

## Case study—WiFi at school

The presentations were followed by a panel discussion about a hypothetical scenario (based on an actual US legal case) in which parents took legal action against a school after their son, George, developed electromagnetic hypersensitivity (EHS). The 12-year-old had been a student at the school for six years. After an industrial-strength wireless system was introduced, he developed symptoms—headaches, itchy skin, rashes, chest pain, nausea, dizziness and nose bleeds—that persisted for several hours after school and that disappeared on weekends and holidays and for which his doctor could find no medical cause. EHS was diagnosed. Other students at the school presented with similar symptoms. The school did not cooperate with the parents' request to accommodate their son's sensitivity and the parents initiated legal action.

Australian authorities have adopted the view that EHS occurs as a result of fear of technology (the nocebo effect). Could this explain the child's symptoms. Not so, said Professor Kearney. 'On the balance of probabilities George is not psychosomatic. At age 12 he would not comprehend EHS, not have a psychological predisposition to these symptoms.' However, his symptoms could easily be explained by wireless radiation activating his mast cells to produce allergic-type reactions.

Dr Bandara explained that other students are experiencing similar reactions from wireless exposure at school and referred to a UK student who recently committed suicide after her school failed to respond to her parents' request to accommodate her problems.

'Regulators have let everyone down,' said David, referring to work by Professor Martin Pall. The school principal cannot realistically be expected to research complex issues such as this and is bound to rely on the regulatory standards.

Jenne Tzavaras said that the school's dismissal of the possibility of EHS—when three experts had diagnosed the condition—and its patronising attitude towards the parents could be construed as negligence and was a dereliction of its duty of care.

How might a court assess the scientific evidence for George's condition? Would the only-thermal-effects-cause-health-problems claims of the World Health Organisation be sufficient to sway the court?

Not necessarily. 'It's not a matter of how many experts are on each side,' explained David Anderson. Rather, it's a question of the evidence they present to the court.

After considering the evidence from both sides of the debate, Paul Wentworth declared that it was the plaintiffs who had the stronger case.

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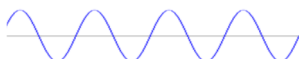
# Dirty Electricity

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Could 'dirty' electricity be contributing to health problems in your home or your workplace? At least some evidence suggests that it may be linked with a number of chronic diseases.

## What is Dirty electricity?

Dirty electricity is a term used to describe interruptions to the flow of current running through electrical wiring. Electricity leaves the generating plant that gave rise to it in the form of a smooth undulating sine wave that looks rather like this—although, in reality, over 4800 kilometres separates each of the peaks on this graph.



However, during its travels, the smooth undulations of the sine wave become distorted by the electrical equipment it feeds. The result is a high frequency signal that's superimposed on the low frequency sine wave.

Dirty electricity in a home can originate from electronic equipment within the home, from neighbours' electronic equipment or from external sources such as base stations. It can be carried by both wiring and by conductive water pipes. Some of the devices that commonly cause dirty electricity are these:

- computers;
- halogen lights,
- compact fluorescent lights;
- older fluorescent lights;
- transformers;
- plasma TVs;
- DVD players;
- sound systems;
- dimmer switches;
- variable-speed motors;
- mobile phone base stations;
- solar power inverters.

## Dirty electricity and health

Dirty electricity has been linked with a number of health and behaviour problems.

### Cancer

A cancer cluster in teachers at the La Quinta Middle School in California (18 cancers in 137 teachers) was linked to dirty electricity. The higher the levels in the classroom, the greater the cancer risk. (Milham, S, 'Dirty Electricity', iUniverse, 2010.)

### Behaviour and learning

Students at Vista de Monte elementary school in Palm Springs, California were reportedly hyperactive and unteachable. When dirty electricity was reduced in the classroom, behaviour and teachability improved. (Milham, S, 'ibid')

### Health and behaviour

Dirty electricity levels were reduced by over 90% in three schools in Minnesota. 64% teachers reported improvements in headaches, weakness, dry eyes or mouth, facial flushing, asthma, skin problems, mood, depression and anxiety. 30% felt worse and 6% reported no changes. Student behaviour reportedly improved. (Havas and Olstad, 2008.)

### Neurotransmitters

High levels of dirty electricity were measured at the Olympia Timberland Public Library in the US. When DE levels were reduced, levels of two neurotransmitters (dopamine and phenylethylamine) improved in seven library workers. (Milham ibid)

## Other problems

Case studies and anecdotes showed that reducing DE:

- reduced students' needs for asthma inhalers;
- improved ADHD behaviour in students;
- reduced insulin requirements for type 1 diabetes
- lowered blood sugar in type 2 diabetes
- improved balance and led to fewer tremors in MS patients. (Havas, 2006)

## What can you do?

Dirty electricity can be measured with our new DeTekta meters, available for hire or purchase, which measure in the frequency range 10 kHz to over 1 MHz (see picture below).

Dirty electricity can be reduced with our Dirty Electricity Mains Filters—usually a small number will suffice for the average home.

For more information, see: [www.emraustralia.com.au](http://www.emraustralia.com.au)



# WATT'S THE BUZZ?

## Driver distraction

It seems that people just can't stop using their mobile phones—even when they're driving!

Researchers in the US observed two groups of drivers: a thousand while stopped at traffic lights and another thousand while in motion. They found that eight percent of those who were in motion were either talking on their mobile phones or texting. Among those stopped at traffic lights, over six percent were talking and over 14 percent were texting. (Bernstein, JJ and Bernstein, J, *BMC Public Health* 15(1):968, Sept. 2015.)

## Ideology

Want to change ideology? Use magnets to generate electric current in the brain.

Scientists from the University of York applied transcranial magnetic

stimulation (TMS) to the part of the brain involved in detecting and solving problems. They found that exposure altered both religious perceptions and prejudice. After exposure, participants were less likely to believe in God and were less concerned about immigration. (*Express*, 15.10.15.)

## Hot kitchen

Soon you won't need to stand close to the oven to be in a hotspot in your kitchen. Hoover has created a range of kitchen appliances that are wireless hotspots themselves. The appliances use radiofrequency radiation to communicate information to and from a house's smart meter and the owner's wireless devices.

'Stay in touch with your home, wherever you are?' says the company's website. We wonder why anyone would want to! (<http://hooverwizard.com/>)

## Teens

How much time do teenagers spend using smart phones?

To answer this question, research on 263 primary and secondary school students in Hungary, showed that the average girl used her smart phone for five and a half hours a day, while the average boy spent three and a half hours on the device. Smart phone use was higher for 16-year-olds, who spent six and a half hours using it. Heavy users aged 17 to 19, tended to have higher levels of impulsiveness, anxiety, depression, attention deficit and somatic problems. (Körmendi, A, *Psychiatr Hung* 30(3):297-302, 2015.)

## Aussie mum wins WiFi battle with school

An Australian mother has succeeded in preventing the installation of WiFi in the school attended by her child, who had developed reactions to EMR, especially WiFi and Bluetooth.

When her child's school considered the installation of WiFi, she submitted a comment to the Department of Education's website reporting her child's sensitivity, requesting assistance to find a high school without WiFi exposure and raising issues of disability and discrimination.

The school and district education officers then engaged in discussions with the mother.

She referred to a number of publications on issues of disability and accessibility in education and human rights. These included:

- the United Nations 'Convention on the Rights of Persons with Disabilities
- the Disability Discrimination Act
- and Disability Standards for Education.

She also referred to the MacDonald vs Comcare legal case and failure of Lloyds of London to insure against EMR-related injuries.

Following these discussions, the school introduced a policy to accommodate the child's sensitivity, including using ipads in airplane mode and downloading from the internet after school hours. (<http://www.emfacts.com/2015/11/parents-success-in-stopping-wifi-installation-at->



### TUBEZ AIRTUBE HEADSETS

Protect against mobile phone radiation

[www.emraustralia.com.au](http://www.emraustralia.com.au)

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## Science & wireless forum

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The 2015 Science and Wireless Forum will be held in Melbourne on Tuesday 8th December, from 4 to 7 pm, at Kaleide Theatre, RMIT University, 360 Swanston St.

This is a free event, open to the public and hosted by the Australian Centre for Electromagnetic Bioeffects Research (ACEBR).

The theme of the presentations will be radiofrequency health research. Speakers include ACEBR researchers and Professor Rodney Croft on the topic of international RF safety programs. Dr Bernard Veyret from France will discuss 'New international developments in RF bioeffect mechanism research'.

The talks will be followed by a Q&A panel discussion, drinks and light snacks.

For more information, registration and travel details, see: <http://www.rmit.edu.au/events/all-events/conferences/2015/december/science-and-wireless-2015/>

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## Phones, routers and hotspots

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Heather is extremely sensitive to electromagnetic fields and had taken steps to reduce her exposure inside her home. This included replacing a cordless phone with a corded phone, using a wired internet connection and turning off the wireless on her router. However, she still experienced extreme headaches, that verged on migraines, when working near the router and wondered what could be causing them.

She and her husband hired our Home Test Kit to measure the fields in their home. They checked the router and, as expected, it showed no indication of any wireless emissions. However, a few days later, while checking elsewhere, the meter registered a strong wireless signal which they traced to that very same router.

What had happened? The router had automatically turned on the wireless function, as sometimes happens when receiving updates. No wonder Heather had experienced headaches when near it.

To prevent this from happening in the future, Heather bought a Netgear ASDL2 router from Dick Smith with *no wireless function*. Not only did it stop her wireless exposure, but it was faster than her previous router.

Heather tried various models of wired phones to replace her cordless phones. These included a Vtech phone and two Uniden phones – one for hearing impaired users – but was not happy with the speaker function of any. She finally purchased a Telstra T800 corded phone which she found to be far superior. She wholeheartedly recommends this model to other people who might be considering replacing their cordless phones.



Heather cautions readers with sensitivities to beware holiday locations close to Telstra Air public hotspots. On a recent holiday, she experienced severe reactions—ringing ears, pressure, headaches across the top of the skull, brain fog and pain down her arms and legs—in a unit that was 15- 20m from one of these hotspots. The symptoms, she said, were much worse than those caused by other wireless exposures, especially outside her unit.

You can find locations with Telstra Air hotspots by typing in the post-code of your holiday destination at: <https://www.telstra.com.au/broadband/telstra-air>

Coming mid  
December:  
Check out EMR  
Australia's new  
website at  
[emraustralia.com.au](http://emraustralia.com.au)

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*'she still experienced extreme headaches, that verged on migraines, when working near the router'*

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### BLOC

#### MOBILE PHONE SHIELDS

Block over 96% of radiation absorbed by the brain.

Available from

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## EMR AUSTRALIA

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Quality meters  
for sale or hire

Shielding paint,  
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film

Books

EMR testing  
& remediation

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<b>City</b>		<b>Post Code</b>	
<b>Phone Number:</b>		<b>Gender: circle one</b>	<b>M / F</b>
<b>Email:</b>			
<b>Profession:</b>			
<b>Areas of Interest</b>	Biology / Neuroscience / BioPhysics / Medicine / Psychology / Measurement / Other _____		
<b>Age (circle one)</b>	teens/ 20's / 30's / 40's / 50's / 60's / 70's / 80's / 90's+		
<b>Best form of contact:</b>	Email	Phone	Mail
<b>Best delivery for newsletter:</b>	Email	Phone	Mail Fax

### Membership Payment Options

**Normal Member (\$20), Student/retired (\$10) or associate member - if an organization (\$10)**

Please circle your choice:

A direct debit payment of \$\_\_\_\_\_ plus a donation of \_\_\_\_\_ (optional) can be made to:

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