EMR and Health

Quarterly report on electromagnetic radiation, health and well-being Vol 13 No 4 Dec 2017

5G in Australia

ACMA is inviting public comment on its use of spectrum for future technologies.

The Australian Communications and Media Authority (ACMA) has released its 'Five-year spectrum outlook 2017-21' outlining its plans for allocating spectrum for 4G and 5G telecommunications technologies.[1] The Authority is inviting public comment on this and other documents related to its planned use of spectrum in December.

Fifth generation technologies promise faster speeds and greater connectivity, described by Vodafone as follows: 'Think car sensors that interact with traffic lights, clothes that interact with your office environment, and drones that can drop a package to your location wherever you are – some 50 billion predicted devices interacting more personally than ever before.' [2]

It also means more radiation will be emitting from more sources, including 'smart' household appliances and the large numbers of new base stations that will be needed to support the new networks.

Scientists have expressed concern about the impacts of this radiation on public health (page 2). A spokesperson from the OCEANIA Radiofrequency Scientific Advisory Association (ORSAA) told EMR Australia, 'Given all the uncertainties, even a small risk factor would mean a large cost burden to society over the next few decades.'

The ACMA plans to reallocate the 3.6 GHz band for 5G in both metropolitan and regional areas. This, ACMA says, 'will help position Australian operators to be at the forefront of the 5G revolution'.

The 3.6G frequency is also being considered for 5G use in other countries. For example, UK telecommunications company Ofcom says it aims at 'expanding spectrum access for future mobile services in the 3.6GHz to 3.8GHz band in order to enable citizens and consumers across the UK to benefit from future mobile services including 5G.' [3]

The ACMA also plans to reconfigure the 890-915 and 935—960 MHz bands, previously used for 2G phone networks, for 4th generation long term evolution (LTE). 2G networks are being progressively switched off.

1. https://www.acma.gov.au/theACMA/~/link.aspx?_id=3E062F5A28A243548D496FDAE7198439&_z=z
2. https://www.vodafone.com.au/red-wire/5g-by-2020
3. https://www.ofcom.org.uk/consultations-and-statements/category-1/future-use-at-3.6-3.8-ghz

In This Issue

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Scientists warn of 5G risks

On 13 September, over 180 scientists and doctors from 36 countries endorsed an appeal to the European Union for a moratorium on the roll-out of fifth generation mobile telephony.

It claimed that 5G technology would lead to ubiquitous exposure of the entire population to radiofrequency (RF) radiation that has been proven to be harmful. This radiation would be emitted by large numbers of transmitters and appliances, with potentially '10 to 20 billion connections'.

The authors referred to research showing harmful effects of RF radiation on humans, plants and animals. These include the recent study by the US National Toxicology Program which found an increased risk of brain and heart cancer and DNA damage in exposed rodents. Based on studies showing brain tumour risks for mobile phone users, the International Agency for Research on Cancer (IARC) classified this radiation as a Class 2B ('possible') carcinogen in 2011. According to the authors, other 'effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans.'

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In their letter, the authors referred to the fact that internationally-accepted documents that require the application of precautions to situations that could cause harm or injury, which are relevant to RF exposure. They also referred to inadequacies of international guidelines for standards, saying 'The current ICNIRP "safety guidelines" are obsolete' and he fact that the adverse effects from exposure occur at levels that comply with these limits.

The letter was submitted by Professor Lennart Hardell of Őrebro University, Sweden, author of numerous studies showing a link between long-term mobile and cordless phone use and brain tumours, and by Professor Rainer Nyberg, Finland.

The letter asks the European Union:

1. 'to take all reasonable measures to halt the 5G RF-EMF expansion until independent scientists can assure that 5G and the total radiation levels caused by RF-EMF (5G together with 2G, 3G, 4G, and WiFi) will not be harmful for EU-citizens, especially infants, children and pregnant women, as well as the environment.
2. 'to recommend that all EU countries, especially their radiation safety agencies, follow Resolution 1815 and inform citizens, including, teachers and physicians, about health risks from RF-EMF radiation, how and why to avoid wireless communication, particularly in/near e.g., daycare centers, schools, homes, workplaces, hospitals and elderly care.
3. 'to appoint immediately, without industry influence, an EU task force of independent, truly impartial EMF-and-health scientists with no conflicts of interest to re-evaluate the health risks and:

    a) To decide about new, safe "maximum total exposure standards" for all wireless communication within EU.

    b) To study the total and cumulative exposure affecting EU-citizens.

    c) To create rules that will be prescribed/enforced within the EU about how to avoid exposure exceeding new EU "maximum total exposure standards" concerning all kinds of EMFs in order to protect citizens, especially infants, children and pregnant women.

1. 'to prevent the wireless/telecom industry through its lobbying organizations from persuading EU officials to make decisions about further propagation of RF radiation including 5G in Europe.
2. 'to favor and implement wired digital telecommunication instead of wireless.'

The appeal in full is available at: http://www.stralskyddsstiftelsen.se/wp-content/uploads/2017/09/scientist_5g_appeal_final.pdf

Mobiles and headaches

A study published in the October issue of *Nature* confirms what many people have known for years—that using a mobile phone can cause headaches.

Jing Wang, from Nankai University in China andand colleagues, conducted a review and meta-analysis of the studies that had investigated the mobile phone-headache link between 1990 and May 2017. Seven studies met their criteria, involving 21,505 participants from Europe and Asia.

The results showed that people who used mobile phones had a higher incidence of headache than those who didn't. Further, phone users were more likely to experience headaches when they made more or longer phone calls. These findings were supported by other studies that the authors didn't include in the review.

'The results of our met analysis and lots of previous studies herein supported current clinical opinion that MP use may cause increased risk for headache,' the authors concluded.

How mobile phone radiation causes headaches is not entirely clear, the authors wrote. One possibility is that mobile phone radiation may cause breaches of the blood-brain-barrier, allowing harmful substances to enter the brain. Another is that it affects the dopamine-opiate system.

Mobile phone use is on the rise, Wang and team say, so action needs to be taken to protect people from harmful effects of use. They say, 'It is ...advisable to suggest that excessive use of MP [mobile phones] should be avoided by increasing social awareness through health promotion activities. It is imperative that health care professionals, clinicians and common people are educated about the deleterious influence of MP on headache. And it is reasonable to instruct children and adolescent about a prudent use of MPs. In addition, we encourage screening of headache patients during routine clinical visits to identify those patients to explore excessive MP use as a potential cause. Intervention and policies must be developed, evaluated and carry out at the population level to raise the awareness of the potential adverse health effects to decrease the headache caused by MP using.'

''It is ...advisable to suggest that excessive use of mobile phone should be avoided'

One of the early studies showing a link between mobile phone use and headaches was conducted by an Australian doctor, Bruce Hocking almost 20 years ago. Hocking found that mobile phone users reported 'unpleasant sensations such as a burning feeling or a dull ache mainly occurring in the temporal, occipital or auricular areas.' Symptoms began either soon after making the call or later in the day and lasted up to an hour after the call or into the evening. No such symptoms were reported for regular mobile phone use. [2]

Headaches are one of the most common symptoms to be reported by mobile phone users. Several callers to EMR Australia have reported that they can tell what type of wireless technology they are being exposed to—such as Bluetooth, WiFi or mobile phone radiation—by the nature and position of their headaches.

Credit: iStockphoto/Luis Pedrosa

Mobile phone users can reduce the absorption of wireless radiation into the brain during calls by using wired phones where possible; by texting rather than calling; by keeping the phone at a distance during calls eg by using Airtube headsets (p 11); by using protective phone cases such as the BlocSock or Wavewall shields (see page 12).

1. Wang, J et al, 'Mobile Phone Use and the Risk of Headache: A Systematic Review and Meta-analysis of Cross-sectional Studies', *Nature* , *Scientific Reports* 7, Article number: 12595(2017); https://www.nature.com/articles/s41598-017-12802-9

2. Hocking, B, 'Preliminary report: symptoms associated with mobile phone use', Occup Med (Lond). 1998 Sep;48(6):357-60.

RESEARCH UPDATES

ELF fields
(from electrical sources)

Neonatal incubators

To determine the risk of magnetic field exposures in neonatal incubators for premature babies, Italian scientists conducted a review of relevant studies. From the results of 15 studies, they determined that magnetic fields ranged from 2 to 100 mG in incubators. Further, medical staff could be exposed to fields as high as 200 mG from the machines. These levels are sufficient to interfere with melatonin production or vagal tone, the authors said and recommended designing incubators so as to reduce magnetic fields to babies and caregivers. (Bellieni, CV et al, *J Matern Fetal Neonatal Med,* Oct 23:1-5, 2017.)

Performance

Does exposure to magnetic fields adversely affect people's sleepiness? To answer this question, Iranian scientists exposed 64 young people, aged 18 to 24 to magnetic fields of 10, 14 or 18 Hz. They found that exposure increased reaction times and negatively affected performance. (Ayoobi, F et al, *Neurol Res* ,Sept 27:1-6, 2017.)

Other studies showing effects from RF radiation

- Fibroblast cells exposed to pulsed electromagnetic fields showed evidence of reduced viability. (Koziorowska, A, *J Biol Regul Homeost Agnets,* Jul-Sept: 3(3), 725-30, 2017.)
- Magnetic fields affected the metabolism of spirulina plants. (Deamici, KM et al, *Bioresour Technol* Sep 28; 249:168-174, 2017.)
- A review showed that magnetic field generally increased levels of reactive oxygen species (free radicals), but not all results were consistent. (Wang H and Zhang X, *Int J Mol Sci* Oct 18, 2017.)

RF/wireless radiation

Fertility

To see whether electromagnetic radiation affected male fertility, Iranian scientists exposed 40 semen specimens to radiation from a 3G mobile phone and a WiFi modem. They found that WiFi exposure significantly reduced sperm motility—a factor that could contribute to infertility. (Kamali, K et al, *Urologia* Sept, 2017.)

Sperm

Scientists from Austria investigated how radiation from mobile phones carried in the trousers affected the sperm integrity of 468 men attending an infertility clinic. The authors found that storing a phone in the pocket was linked with changes to sperm morphology and luteinizing hormone, which plays a role in fertility. (Schauer I and Al-Ali M, *Wien Klin Wochenschr* Oct 13, 2017.)

Memory

Scientists from India and the USA investigated the effects of WiFi radiation on memory and learning in the young. They exposed 12-week-old mice to a 2.45 GHz signal for 2 hours a day for 15, 30 or 60 days and assessed their learning and spatial memory in a maze test. The results showed that exposed mice learned more slowly, made significantly more memory errors and had higher stress (cortisol) levels than unexposed mice. The authors concluded that exposure increased stress and 'suppresses signaling mechanism(s) of hippocampal memory formation'. (Shahin, S et al, *Toxicol Sci* Oct 23, 2017.)

'They recommended designing incubators so as to reduce magnetic fields to babies and caregivers'

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 (μT)

0.1 mT = 1000 mG

0.01 mT = 100 mG

1 μT = 10 mG

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

Megahertz (MHz) - million Hz

GigaHertz (GHz) thousand million hertz

Brain

Radiofrequency radiation had harmful effects on the brain in a study from South Korea. Researchers exposed mice to a field of 835 MHz for 5 hours a day and observed changes to the synaptic vessels (which store neurotransmitters) and a decrease in certain genes and proteins. They concluded that exposure to this radiation can cause changes to neurotransmitters in the cerebral cortex. (Kim JH et al, *PLoS One* Oct 18:12(10), 2017.)

Symptoms

Researchers from Perth and the USA conducted a study on the technology used in a high-socioeconomic school and the effects of this use. They found that girls used i-tech devices for an average of 3.65 hours a day and boys, for slightly less time. Students in grades 5 to 9 mainly used tablets, whereas students in years 9 to 12 mainly used laptops. Many students reported musculoskeletal and vision symptoms and severity of the symptoms was related to the number of hours of device use. (Straker, L et al, *Ergonomics* Nov 6:1-40, 2017.)

Other studies showing effects from RF radiation

- Mice exposed to a 1.8 GHz signal showed evidence of anxiety. (Zhang, JP et al, *Int J Environ Res Public Health* 14 (11), 2017.
- Rats exposed to WiFi radiation showed evidence of anxiety. (Othman, H et al, *Metab Brain Dis* 32(5):1459-69, Oct 2017.)
- Mobile phone radiation caused permeability of the blood-brain-barrier in rats. (Poulletier de Gannes, F et al, *Sci rep[* 7(1):15496, 2017.

Children's exposure to mobile phone radiation

Not only do children the heads of children absorb more radiation than those of adults, but previous assessments of their exposure have not taken relevant factors into account.

In their new paper, Dr Beadaa Mohammed from the University of Queensland and colleagues report that the brain tissues of a 3-month-old absorbs 61% more radiation at 700 MHz and 78% more radiation at 2600 MHz than do the brains of adults.

Their findings were based on modelling that differentiated it from previous such assessments. Whereas previous studies based their calculations on different head sizes and dielectric properties, the Australian team also took into account differences in brain anatomy, making their results more reliable.

According to the authors, 'the results indicate that the maximum SAR (10g) and the total absorbed power in children's heads are higher than those predicted in previous studies using scaled adult head models.'

In other words, previous studies have underestimated the effects of mobile phone radiation on children's heads.

These results suggest the wisdom of reducing children's exposure to mobile phone radiation, as recommended by many international authorities.

Mohammed, B et al, 'Evaluation of children exposure to electromagnetic fields of mobile phones using age-specific head models with age-dependent dielectric properties', IEEEXplore, DOI 10.1109/ACCESS.2017.2767074, IEEE Access, http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8086149; http://ieeexplore.ieee.org/stamp/stamp.jsp?

'the heads of children absorb more radiation than those of adults'

'WiFi exposure significantly reduced sperm motility—a factor that could contribute to infertility.'

Wireless radiation and cardiovascular disease

Wireless radiation may well be a risk factor for cardiovascular disease and further research on the connection is needed, say Dr Priyanka Bandara and Mr Steven Weller from the Oceania Radiofrequency Scientific Advisory Association (ORSAA) in the *European Journal of Preventive Cardiology*.

A recent study, lead by cardiologist Professor Gemma Figtree from Royal North Shore Hospital in Sydney, showed that, between 2006 and 2014, there was a significant increase in the numbers of people who suffered a heart attack, yet exhibited none of the conventional risk factors for it—hypertension, cholesterol, diabetes or smoking. The authors concluded that new risk factors for heart disease need to be identified.

Wireless radiation may just fit the bill.

It's known that wireless radiation affects the cardiovascular system, say Bandara and Weller. Some studies have found increased rates of cardiovascular disease among exposed populations. Others have found that exposure increased blood pressure or changed heart rate.

One of the ways in which wireless radiation could contribute to cardiovascular disease, say Bandara and Weller, is by causing oxidative stress. When they reviewed 242 studies on the link between wireless radiation and oxidative stress, they found that the vast majority—89 percent–found that exposure did, in fact, increase oxidative stress, a factor known to be implicated in cardiovascular disease.

There may be other ways in which wireless radiation contributes to cardiovascular disease as well, the authors say. It has been shown to deregulate autonomic control of the cardiovascular system, to change heart rate variability and to affect voltage-gated ion channels—all of which could have down-stream effects on heart health.

'It's clearly time to investigate the potential role of RF-EMR exposure from common wireless device use on CVD [cardiovascular disease]', the authors say.

In the meantime what can people do? Dr Bandara suggests 'reduce your exposure to wireless radiation; use wired connections rather than wireless connections whenever possible and, particularly, avoid carrying a mobile phone close to your body— in your chest or trouser pocket–while it's turned on .'

Bandara, P and Weller, S 'Cardiovascular disease: Time to identify emerging environmental risk factors', *European Journal of Preventive Cardiology*, (Epub ahead of print DOI:10.1177/2047487317734898)

UPDATES FROM AROUND THE WORLD

Germany

A German router manufacturer has advised taking precautions to limit exposure from its equipment. The user manual of the Speedport WiFi router says, ' You should not place it into sleeping rooms, rooms for children and for people to stay there because of the integrated antennas of the Speedport. Those antennas emit and receive electromagnetic waves e.g. for the WiFi. The aim is to keep the exposition by radiation as low as possible.' (Translation by Christine Aschermann)

California

Governor of California Jerry Brown has vetoed a bill aimed at making it easier for telecommunications companies to install antennas. The bill, supported by the communications industry, would have allowed carriers to install small antennas close to residences without requiring local government approval. Residents have hailed the Governor's action as a win for the democratic process. (*Mercury News* 16.10.17.)

USA

The US Federal Government is considering legislation to support the introduction of driverless cars on the road, overturning existing legislation which bans such vehicles. The new legislation would allow manufacturers to deploy almost 25,000 cars in the first year without meeting current safety standards. One of the requirements of the bill is that driverless vehicles have the capability to detect whether passengers are in the rear seats—to prevent children being left behind! (Reuters, 06.09.17.)

India

A court in Mysuru issued a temporary injunction to prevent a mobile base station in the suburb of Gokulum from being turned on. The court's decision follows a petition by residents concerned about the effects of radiation from the antennas. The court also heard concerns about the structural integrity of the building on which the base station would be located. (*The Hindiu,* 12.10.17.)

‘Smart’ meters in Australia

From 1 December new rules apply to the installation of electricity meters in states other than Western Australia, as Rule No 12 2015 of the Australian Energy Market Commission (AEMC) National Electricity Amendment comes into effect. [1] This rule provides that no further ‘basic’ electricity meters will be installed and that all new meters will be ‘advanced’ meters, sometimes referred to as ‘smart’ meters. These meters will be installed by metering providers rather than electricity retailers themselves.

This is not a new development. Advanced meters have been installed in many Australian homes over the past decade, for example, in new buildings and buildings with solar installations.

Advanced meters are being described as ‘smart’ meters. However, the term ‘smart’ means different things in different situations Some ‘smart’ meters, such as those installed throughout Victoria, communicate information about electricity consumption wirelessly, as opposed to requiring manual meter reading, exposing people inside homes to radiofrequency radiation, and many people have reported the development of unpleasant symptoms after their installation.

However, not all ‘smart’ meters in other states will be wireless-enabled to begin with. For example, Type 4A electricity meters are not connected to a telecommunications network and are not required to be read remotely—at this stage. Some networks may use wired phone lines for conveying metering information to retailers.

However, it is clear where this technology is heading. There is no doubt that the industry, supported by governments, wants electricity meters that convey information via wireless radiation so they can be read remotely. However, to avoid the problems that resulted from Victoria’s forced installation of wireless meters on people’s homes, governments are encouraging customers to accept these meters voluntarily. The NSW government, for example, refers to ‘the voluntary market led roll-out of smart meters across NSW’. [2]

This means we can expect to see more initiatives encouraging people to adopt wireless-enabled smart meters.

What can you do:

- Be aware that not all smart meters are wireless enabled at this stage. You can check with your electricity retailer to see whether yours is.

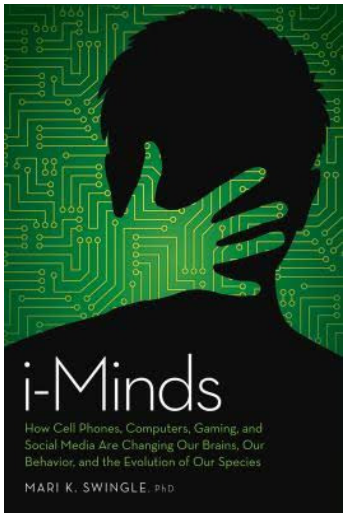
- If it is a wireless-enabled smart meter, you can prevent the radiation from entering your home by applying shielding paint on the *internal wall behind* the smart meter. (See: http://www.emraustralia.com.au/shop/protection-shielding/hf-shielding-paint-hsf54-1-litre) Do not attempt to shield the smart meter externally, as this won’t prevent the signals from entering your home.

- If your meter is not a wireless-enabled smart meter, be on the look out for initiatives to encourage you to accept changes to your meter, such as economic incentives or invitations to swap to what are euphemistically referred to as remote monitoring meters.

1. AEMC, ‘National Electricity Amendment (Expanding competition in metering and related services) Rule 2015 No. 12’,

2. NSW Department of Industry, ‘Smart Meters Update for ASP’s’ [stet]. https://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0011/684137/Smart-Meters-FAQ.pdf

Internet technologies and the brain



Digital technologies that connect to the internet are wonderful tools for accessing information, communicating and playing games. But how do they affect our work, our play and our education? In her book 'i-Minds', Dr Mari Swingle, a neurotherapist and behaviour specialist, discusses how mobile phones, computers, gaming and social media are changing our brains, our behaviour, and the evolution of our species.

While the benefits of internet usage are well-recognised, Dr Swingle says that there is a darker side to digital technologies that is lesser understood. 'The negative influences of digital media are expanding, blindly accepted by most—educators, business, parents, and partners, who later wonder what went terribly wrong,' she writes.

Digital devices have a seductive appeal. Using them creates a state of arousal or 'high' that can lead to addiction and this can have enormous consequences for affected users. She says, 'Excessive usage of digital media has a concrete relationship to attention deficit hyperactivity disorder (ADHD), autism, and mood deregulation including anxiety, depression, and anger management, other forms of addiction, and all behaviors on the obsessive-compulsive spectrum.' The signs of problem behaviour she has identified are when a person can't manage without their digital devices, can't stop using them, prefer them to contact with other people or use them to the point that their relationships, education or work suffer.

Overuse of digital media can have harmful effects on the brain. It speeds up the brain, causing a state of arousal that reduces a person's ability to entertain themselves, observe, integrate information and be creative.

Swingle recounts some fascinating research that shows how digital devices impact on the brain and what makes the brain vulnerable to addiction. In one study, she found that people with internet addiction displayed EEG patterns that were linked with depression, anxiety, emotional deregulation, ADHD and perseveration or fretting. Not surprisingly, 'the rates of anxious depression, anxiety and insomnia are skyrocketing', she says. It seems that people with those conditions are more at risk of internet addiction and those with internet addiction more at risk of depression, anxiety and insomnia.

Moreover, her EEG research revealed a remarkable fact. Swingle found that the EEG patterns of gaming addicts all showed unusual activity in the Alpha band frequencies—a brainwave frequency band that plays a very important role in attention, intelligence, PTSD identification and recovery and creativity. Some of these changes were also similar to those that would normally be seen in people with seizures or epilepsy. In other words, i-tech is 'hijacking' the Alpha brain activities and reducing children's creativity. 'This to me is a great tragedy, not only to the individual but to society as a whole. We potentially are losing our greatest innovative thinkers,' she says. Moreover, i-tech activities recruit Alpha activity in inappropriate parts of the brain, contributing to ADHD.

The detrimental effects of i-tech on Alpha brain wave patterns can be modified if parents take action to help their children early enough and firmly enough. This 'means restricting all usage that is not scholastically imperative', says Swingle. Naturally, children commonly resist such interventions. With all their free time consumed by i-tech, they often lack friends, hobbies and skills for other activities and simply don't know how to fill their time.

For some children, the risks associated with i-tech are particularly concerning. 'Any child who is on the Autistic or Asperger's spectrum is at disproportionate risk for total derailment with any and all use of i-tech,' Swingle says. She urges care givers to make sure that these children do not use i-tech under any circumstances and warns that doing so will

exacerbate their symptoms and compromise their social and emotional development.

I-tech is changing the way that children learn—and not necessarily for the best. Many online learning activities reward 'correct' answers and penalise 'incorrect' answers, providing no opportunity for lateral thinking. 'If this process is repeated often enough, the child will essentially reprogram his or her processing to think as the program does, pruning human thinking to a specific form of computer thinking,' says Swingle. It changes human learning from investigative and discovery based to polarised right/ wrong learning.

Further, educational games that entertain create the need for more and more and more entertainment in education—not all of it matched by learning. People often learn much more from human tutors than they do from screens. Indeed, Swingle says, many language studies in infants suggest that, in the very young, language can only be learned through social interaction (or social reinforcement). Similarly, young people learn more by writing than by keyboarding and writing out letters at an early age seems to help children learn to read when they're older. Swingle's greatest concern is what many parents of young children routinely do—the giving of i-tech to children to keep them engaged and quiet. When young children are engaged with i-tech, unlike other toys, they are not conscious of the wider environment, the people around them, their facial expressions and body language—in short, to the cues that they need to learn. In other words, they are learning to connect with objects rather than people. Swingle says that 'Very young children are starting to relate to technologies and objects more than with parents and caregivers, and this can have irreversible affects in both socialization and emotional deregulation. It is also a key symptom of Autism.'

The consequences of this for family life and for society in general are alarming. Using electronic media as babysitters creates as many problems as it solves, says Swingle. It 'revs children up and emotionally deregulates them, leaving them more likely to tantrum and less capable of self-entertaining, self-occupying. It also affects their ability to sustain focus in school and on homework, self-care, parental direction, or chores.'

It also means that children, disengaged from their parents, are no longer looking to their parents for advice and direction and are looking to their less socially-experienced peers and to the internet instead.

And it's not just advice they're finding on the internet. Swingle explores the dangers of explicit sexual content, including pornography, not just for children but for teens and adults. The internet is changing the age at which children become sexually aware, people's sexual expectation as well as their sexual interest and emotional involvement with their partners.

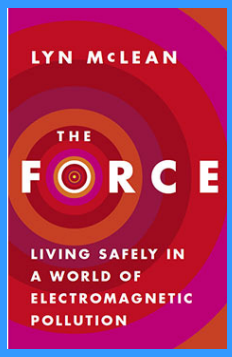
At least bonding through social media is making us happier, isn't it? Well, no, says Swingle. Studies show that replacing interpersonal communication with i-tech makes people more depressed and even having large numbers of on-line contacts leaves people feeling empty.

Worse, overuse of i-tech can be associated with the development of autism- and Asperger's– like characteristics—including reduced social skills, reduced ability to understand emotions, reduced inhibition and desensitisation.

'Some of the young and the old who cross my clinical floor are clearly harming themselves and their families with over focus or otherwise excessive or misdirected use of

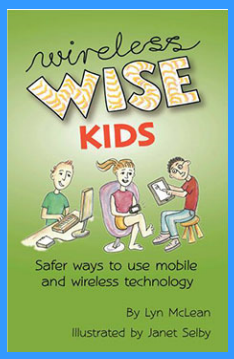
(Continued on page 10)

Books by Lyn McLean



'The Force'

'Wireless-wise Families'



'Wireless-wise Kids'

for everything you need to know about keeping your family EMR-safe
emraustralia.com.au

WATT'S THE BUZZ?

I of T

A group of US senators is planning legislation to minimise the risks they perceive of rolling out the Internet of Things (I of T)—where appliances will connect remotely to each other. Senator Cory Gardner, Chair of the Senate Cybersecurity Caucus, says that the IofT can be hacked, allowing people to eavesdrop on other people's conversations, see what they're doing and potentially disrupting the operation of large numbers of devices. (CBS Denver, http://denver.cbslocal.com/2017/09/12/internet-of-things-cybersecurity

Hello, hello

'Hello,' you might say when you answer your phone—but do you know why?

Did you know that the word *hello* was originally 'hallow' from when sailors hailed each other and used as early as the 1400s?

The Viking war cry 'Ahoy', was the term used to answer the phone by the operator of New Haven's first telephone switchboard in 1878.

'Hello' was first used to answer a phone call by inventor Thomas Edison—and so the habit was born.

Electricity

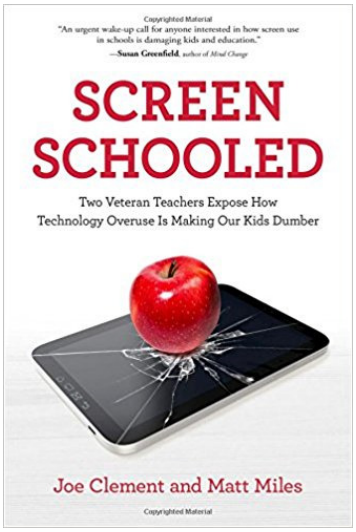
Then there is electricity—the demon, the angel, the mighty physical power, the all-pervading intelligence! … [B]y means of electricity, the world of matter has become a great nerve, vibrating thousands of miles in a breathless point of time.

Nathaniel Hawthorne, *The House of the Seven Gables* (1851)

Screen schooled

Screen-based education is great for our kids, isn't it?

Not necessarily, say teachers Joe Clement and Matt Miles. In their new book, 'Screen schooled', they report their first-hand observations about how damaging technology overuse and misuse has been to our kids. On a mission to educate and empower parents, they show how screen saturation at home and school has created a wide range of cognitive and social deficits in our young people. They lift the veil on what's really going on in schools: teachers who are often powerless to curb cell phone distractions; zoned-out kids who are helpless and are unfocused, unprepared, and unsocial; administrators who are influenced by questionable science sponsored by corporate technology purveyors. They provide action steps parents can take to demand change and make a compelling case for simpler, smarter, more effective forms of teaching and learning.



Available from Amazon: https://www.amazon.com/Screen-Schooled-Veteran-Teachers-Technology/dp/1613739516/ref=sr_1_1?ie=UTF8&qid=1508437554&sr=8-1&keywords=screen+schooled&tag=bisafetynet2-20

(Continued from page 9)

i-tech. They are suffering from behavioural and conduct disorders, learning disabilities, emotional deregulation (predominantly depression and anxiety, intimacy disorders, and sexual dysfunction). For youth, the classification of failure to thrive also has a gross impact on others.'

Swingle also provides important insights on why parents are encouraging their children's use of i-tech and the growing phenomenon of internet bullying. She discusses the different types of internet addiction and how to cope with it and she talks about activities that can benefit those most at risk.

'There are many positive applications to i-tech as well—we just need to be more aware of the negatives. It's all about informed choice versus blind acceptance when facing both negative and positive change,' Swingle says.

This is a book every parent, caregiver and educator needs to read and thoroughly digest for its invaluable insights into how i-tech is affecting our children, our families, our relationships and our society and what we can do about it.

'i-Minds—how cell phones, computers, gaming, and social media are changing our brains, our behavior, and the evolution of our species', Mari K. Swingle PhD, New Society Publishers, Canada, 2016.

Madrid Resolution

Following a meeting held at the Royal National Academy of Medicine in Madrid on 28 September, a group of scientists endorsed the International Scientific Declaration of Madrid on electromagnetic fields—or the Madrid Resolution, as it is has become known.[1]

The scientists agreed that artificial electromagnetic fields—from electrical and wireless sources—create a public health impact for the community, particular its more vulnerable members, such as pregnant women and children, the sick and the elderly.

They reaffirmed their commitment to the International Scientific Appeal made earlier this year which stated: 'Numerous recent scientific publications have shown that EMF affect living organisms at levels well below most of the international and national guidelines. The effects include the increased risk of cancer, cellular stress, the increase of harmful free radicals, genetic damage, structural and functional changes of the reproductive system, deficits in learning and memory, neurological disorders and negative effects on the general well-being of humans. The damage goes beyond the human species, as there is more and more evidence of harmful effects for both plants and animals.'

They referred to the fact that magnetic fields and wireless radiation have both been classified as Class 2B carcinogens by the International Agency for Research on Cancer (IARC) and said that risks occur at lower levels of exposure than those in current international guidelines. 'The Guidelines of the International Commission for Nonionizing Radiation Protection (ICNIRP) are obsolete and limits should be more restrictive, such as those established in Resolution 1815 of 05.27.2011 of the Council of Europe.' [2]

The Resolution states, 'We exhort the Public Administrations, both at the state, regional and municipal levels, to immediately apply Resolution 1815 of the Council of Europe, incorporating it to its own regulations.' The Council of Europe recommended

- taking all reasonable measures to reduce exposure to electromagnetic fields, particularly from mobile phones and, particularly for children;
- reviewing the ICNIRP Guidelines and applying the ALARA (as low as reasonably achievable) principle to exposure;
- educating people about the potential long-term effects of exposure;
- taking steps to protect electrosensitive people;
- developing safer communications technologies;
- implementing limits of 0.6 Volts per metre (V/m) in the short-term and reducing it to 0.2 V/m in time;
- assessing the risks of new technologies before marketing them;
- introducing labels with information about SAR (Specific Absorption Rates);
- educating parents, teachers and children about the long-term risks of wireless devices;
- using wired, rather than wireless connections, especially in schools.

1. http://www.ecologistasenaccion.org/IMG/pdf/declaracion-de-madrid.pdf;
2. http://www.covace.org/files/62_contES.pdf

New year's resolutions

Here are our top 5 tips to protect your family from exposure to radiofrequency (wireless) radiation— in priority order.

1.Turn off your WiFi!

This is generally the highest source of exposure in a home.

Keep it off as much as possible—only turn it on when necessary.

Better still, use wired connections instead of wireless connections.

2. Replace your cordless phone with a wired phone

Most cordless phones emit radiation 24/7 & can expose users to more radiation than mobile phones.

3. Reduce your use of mobile phones

Holding a phone against your body can expose you to more radiation than allowed by international standards

Use a wired landline whenever possible.

Turn mobiles off when not in use.

Text rather than call.

Don't carry or use mobiles against the body.

4.Reduce your use of tablets

Holding a tablet on your body can expose you to more radiation than allowed by international standards

Use a wired computer rather than a tablet.

Don't ever used a tablet on wireless mode on your body.

5.Don't let children play with wireless devices.

Provide them with safe, wired devices instead.

Encourage them to spend time outdoors in nature.

For more information, see www.emraustralia.com.au

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