



WIRELESS TECHNOLOGY — A DANGER WE CAN'T LIVE WITHOUT...

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Waiting for high levels of scientific proof before taking action on electromagnetic fields can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco (Council of Europe, 2011)¹.

The wireless revolution has effectively changed the way we communicate with one another, enabled us to access information around the globe at the touch of a button, dramatically changed the face of the workforce and positively influenced medicine and education and for that matter, almost every other profession. No more is this more obvious than in our homes: from mobile and cordless phones to baby monitors, smart meters and wireless devices. Our homes are becoming so smart, I'm surprised they haven't figured out how to give birth! As I write this however, I am also aware of the growing number of schools across Europe removing Wi-Fi², EMF free zones in France and Italy³, a growing number of countries recognising Electrical Hypersensitivity as a functional disability⁴ and countries like Germany actively encouraging its citizens to avoid Wi-Fi and use hard wired connections instead⁵.

Questions about the safety of electromagnetic fields in our homes were first raised by Wertheimer and Leeper in 1979 who associated the incidence of childhood leukaemia with exposure to high voltage transmission lines⁶. Since then there have been a flood of studies on

the adverse health effects associated with electromagnetic field exposure typically found in the built environment⁹. As a result of the weight of this evidence, the International Agency for Research on Cancer classified extra low frequency magnetic fields⁸ and radiofrequency electromagnetic fields⁹ used in Wi-Fi and telecommunications as Group 2B carcinogens i.e. possibly carcinogenic to humans. Had they deemed this technology to be safe and without risks to human health, they would have classified them as Group 4 not a carcinogen, but this was not the case. Consequently countries like China, Switzerland, Italy and Russia have set exposure standards well below that recommended by the International Commission on Non-Ionising Radiation Protection¹⁰.

Despite the reluctance of our authorities to acknowledge electrical hypersensitivity as a medical condition, legal acknowledgement of the condition and compensation was awarded to an Australian doctor suffering from the condition this year¹¹.

Children are uniquely susceptible to electromagnetic field exposure because unlike adults their skulls are thinner, their immune and nervous systems are still developing, they undergo increased levels of cell division and they will be exposed to these frequencies over a much longer period of time^{12,13}. Recent statistics indicate that 90% of Australian children use the internet at home, whilst almost 30% of

five to fourteen year olds and 75% of high school students had a mobile phone¹⁴. Studies on the impact of mobile phones and wireless technology on children bring up ethical and moral dilemmas that few in the scientific community are willing to pursue. In addition, apart from the threat of litigation, governments are reluctant to acknowledge adverse health effects because they have embraced the technology and in some cases, made it mandatory for all new school buildings¹⁵, they rely on the millions of dollars in tax revenue, and lastly they recognise that consumers are demanding the technology. Likewise the telecommunications industry needs to ensure dividends for its shareholders. This may explain the lack of data available on children and yet we are exposing millions of them to this technology both in our schools and homes every day. This was recently acknowledged by the Australian Radiation Protection and Nuclear Safety Authority who in February stated "due to the lack of scientific evidence on mobile and cordless phone use by children, we recommend that parents encourage their children to limit their exposure"¹⁶.

In the past 100 years, we have progressively added an enormous amount of man-made signals to the natural electromagnetic background of the planet to the extent that there is practically no where left that is not being influenced by it in some way. This poses an interesting dilemma for the scientific community because of the absence of a control group.

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HOW YOUR HOME INFLUENCES YOUR EXPOSURE TO RADIOFREQUENCY ELECTROMAGNETIC ENERGY

The healthy home should not alter the natural electromagnetic background of the planet (terrestrial radiation) or introduce man-made electromagnetic fields that may pose a health risk¹⁷. Building materials may affect the electroclimate of the home in both a positive and negative way. For example radiofrequency electromagnetic energy will be absorbed through materials like brick, wood, plaster, wall board and cement and, in contrast, will reflect off metal surfaces and steel reinforced concrete¹⁸. Let us take a metal roof as an example. The roof will reflect external sources of radiofrequencies from a nearby mobile phone tower, but will contain these frequencies arising from sources within the home creating hotspots which are impossible to determine without a high frequency meter. As you can imagine, a building biologist would strongly advise against building a steel framed house with aluminium framed windows, built on a concrete slab with a metal roof and yet this is precisely what the green movement encourages. Similarly, using shielding paints, films and fabrics to address external sources of radiofrequency sources may pose an added health risk as internal sources of wireless devices will be reflected back into the home. Consequently, shielding should be considered as a last resort.

The most famous person to have electrosensitivity is Gro Harlem Brundtland, former Prime Minister of Norway and retired Director of the World Health Organisation.

WHY THERE IS A RELUCTANCE TO ESTABLISH A LINK BETWEEN ELECTROMAGNETIC FIELDS AND DISEASE

Electromagnetic fields as a cause of disease has been dismissed by many authorities. There are several reasons as to why this maybe so.

1. It is difficult to establish cause and effect because the exposure to electromagnetic fields is imperceptible, ubiquitous, has multiple sources, and can vary greatly over time and short distances¹⁹.
2. Radio frequencies used in telecommunications and wireless technologies are a form of non-ionising radiation which means they are not strong enough to break (ionise) DNA and cause cancer. Consequently the exposure standards determined by the International Commission on Non-Ionising Radiation Protection are based on tissue heating (thermal effects) at high level exposures. Tissue heating is not an appropriate method to assess health effects in light of the deluge of new scientific studies reporting effects at non thermal low level exposures²⁰.
3. The power levels emitted from wireless technologies is similar to the frequencies used in AM and FM radio. This argument is flawed in light of the fact that it is not the power levels emitted from mobile phones and wireless technologies that scientists are concerned about, it is the fact that they are pulsed frequencies that interfere with the body's own signals²¹.
4. It is not uncommon for experts who make recommendations to government bodies to also be employed by the industry

suspected of creating the problem. Conflict of interest is a common phenomenon in the telecommunications industry both in regards to their involvement in setting the exposure standards and to funding the research²².

5. The great majority of regulators work on the premise that until there is concrete scientific evidence that an agent can cause harm, it is assumed to be safe. This underlying presumption of 'innocent until proven guilty' enables technologies like Wi-Fi which are suspected to be harmful, to undergo extensive scientific trials and judicial reviews which may take decades before action is taken. This reactive approach does not protect our children. Consequently several countries including Switzerland, Russia, China and Italy have adopted the precautionary principle in setting their exposure standards²³.

CAN WE LIVE IN A MODERN SOCIETY WITHOUT SUFFERING FROM THE ADVERSE HEALTH EFFECTS FROM THIS ELECTROMAGNETIC ENERGY?

YES we can!

The science of reducing one's exposure to electromagnetic energy is simple: the strength of a field decreases as the square of the distance from the source²⁴; put simply, as you double the distance away from the source, you will reduce your exposure by 75%. This is referred to as the inverse-square law. Be wary of any devices that claim to shield or reduce your exposure if they do not create a distance between you and the source of the exposure as they are unlikely to be effective.

Transient exposure to high electromagnetic fields is unlikely to create a health concern in most individuals. However exposure to low levels over a long period of time such as during sleep is when problems are likely to arise.



USING A MOBILE PHONE SAFELY

- Use a hard wired landline phone to make calls wherever possible.
- Keep your calls short.
- To keep it away from your head, use the phone on speaker mode or a hands free air tube earpiece.
- Text instead of calling wherever possible.
- Use the phone in a good signal strength area (the maximum number of bars will be displayed on the screen) as it will transmit at much lower levels than in an area with poor reception such as a moving vehicle or lift²⁵.
- Switch your iPhone to airplane mode when watching movies, using an App or playing games. This will turn off Wi-Fi, Bluetooth, cellular and GPS functions which means you will be unable to make or receive calls.
- Do not use the mobile phone as an alarm clock. Even in airplane mode, it will create high levels of magnetic fields when the alarm turns on.
- Do not carry the phone around your waist or on your chest. Where possible, keep it at a distance away from your body.
- Do not use the phone in the car, bus, tram or any other metal carriage as the radiofrequency electromagnetic energy may reflect off surfaces creating 'hot spots' in the vehicle.
- Charge the phone away from areas where you spend time such as next to the bed.
- Shielded phone cases should be avoided as many force the phone to increase power and inadvertently increase radiofrequency absorption in the head²⁶.

INTERNET

- Use ADSL or cabled broadband instead of wireless technology.
- If you use a wireless router, change the power setting to the lowest level (refer to the manufacturer's instructions).
- Keep the router away from where you spend time ie bedroom, study, living spaces.
- Turn the router off when it is not in use as it will continue to emit pulsed microwaves 24 hours per day.

LAPTOP COMPUTERS, IPADS AND THE NEW GENERATION OF IPODS

- Once you have downloaded an App, video, game or document from the internet, switch them to airplane mode. This will avoid exposure to the radiofrequency electromagnetic energy however you will not be able to access the internet in this setting.
- Keep the devices at a distance to your body (such as on a desk) whilst in use. Laptop computers that run off the mains adapter/charger units and battery chargers may emit high electric and magnetic fields. An earthing mat will reduce the electric field, whilst placing the laptop on a desk (not on your lap where they may expose your reproductive organs to microwave radiation) will reduce exposure to the magnetic field.

CORDLESS PHONE

- DECT cordless phones should be avoided as their base units continually emit pulsed microwaves - even when not in use - at levels that can exceed a mobile phone in a good signal strength area²⁷. Substitute it for a wired landline phone.
- If you insist on using a cordless phone, buy an analogue model as this will only emit radiofrequency signals when making and receiving calls.
- Avoid placing the cordless phone base unit in an area where you spend time such as the bedroom.
- Keep your calls short.
- Use speaker mode when talking on the phone.

SMART METER

- The smart meter should be well away from beds, desks, favourite couch and anywhere else you spend time.
- Shielding with fabrics, paints and window films should only be considered as a last resort if you are unable to create a sufficient distance between you and the meter.

DECT BABY MONITOR

Avoid it. Digital (DECT) baby monitors are of particular concern because of their close proximity to the baby and the fact that they emit pulsing bursts of microwave radiation 100 times every second all the time they are turned on²⁸. Talk back models are not recommended as the units continuously emit pulsing radiation even when noise is not being made. Similarly, camera and video baby monitors should also be avoided as they emit higher power levels. If you insist on using a baby monitor, have a proper wired closed-circuit TV (CCTV) system installed²⁹.

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CONCLUSION

We live in a sea of radiation and as technology progresses, the type and level of electromagnetic energy in our homes is only likely to increase (smart meters are designed to communicate with all of your new appliances). However this technology is here to stay and it brings with it a remarkable range of possibilities in the field of education and medical advancements amongst so many other benefits. Can we afford to sit on our hands and wait for the evidence to be conclusive before we react and do something about it? Remarkably we don't need to. There are effective alternatives available that enable us and our children to use this technology safely. After all, we don't want another asbestos on our hands...

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