IRRADIATED

A comprehensive compilation and analysis of the literature on radiofrequency fields and the negative biological impacts of non-ionizing electromagnetic fields (particularly radiofrequency fields) on biological organisms

American English version

Edition 1.1

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Introduction

Today, wireless technology has become ubiquitous in many places. Since the 1980s, there has been an explosion in the popularity of mobile, wireless technology. At first, that sounds great, right? After all, what could be so bad about wireless? Sure, it isn't secure, it isn't reliable, it isn't fast and it interferes with your social life (as is acknowledged by motivational speaker Simon Sinek), but what's not to like about that?

Cell phones, cellular and radio towers, cordless phones, walkie-talkies, Wi-Fi, "smart"-meters, and all other wireless technologies and appliances, emit radiofrequency radiation, which the World Health Organization classified in 2011 as a **Class 2B carcinogen**, in the same category as neurotoxins such as lead and the omnipresent pesticide DDT. In the past five decades, there have been thousands of peer-reviewed studies released that state wireless technology has the ability to negatively affect health. Today, relatively few people know about this, because wireless companies that make trillions off of ignorant customers would like to keep their customers, well, ignorant. While 70% of non-industry studies have reported negative health effects associated with wireless, only 30% of industry studies report any such findings.

Today, a growing number of people are becoming aware of the health impacts. Wireless communications negatively affect organisms from all walks of life as we are all bioelectrical organisms whose cells communicate using fragile electrical impulses. The cells in our bodies are incredibly complex life forms that have evolved over thousands of years to the natural background levels of RF radiation in our environment. Today, we are exposed to 100 million to 10 billion times more radiation than our grandparents were, and this radiation has been shown to have biological implications in thousands of peer-reviewed studies. The FCC standards are essentially useless, being at least 3 million times higher than levels at which severe biological implications have been observed at the cellular level. Wireless can tamper with, or alter our internal chemistry, since we are essentially a giant antenna. Some of the negative health implications caused or exacerbated by wireless communications include sleep disorders, insomnia, calcium efflux, difficulty concentrating, headaches, heart palpitations, cardiac stress, cancer, brain tumors, neuron damage, migraines, fatigue, tinnitus, negative thoughts, digestive problems, brain fog, DNA damage, memory loss, ADHD, autism, depression, stress, dizziness, cell mutations, decreased brain activity, neutralized sperm, infertility, asthma, allergies, rashes, and electromagnetic hypersensitivity. Children are even more vulnerable, as their heads are smaller and they have higher water content, and thus they absorb more of the radiation – much of it penetrating deep into their brains; this is why people who begin to use cell phones on a regular basis before age 20 are five times more likely to develop malignant brain tumors throughout their lifetime. Brain tumor rates have increased fivefold since the 1980s, autism rates are exponentially increasing, and today's children complain of excessive fatigue and are more depressed than ever. Today's schools, with their tablets, laptops, cell phones and Wi-Fi, are doing little to remedy this situation.

There is also the safety concern – more people had landlines in the late twentieth century than do today – which may put countless lives in jeopardy – it is now easier than ever to reach 911 but harder than ever for them to find you. In an emergency, access to a landline telephone could be the difference between life and death.

Concerned? You should be. While the FCC and wireless carriers want to play games with your health, we think you should know the facts. Many scientists are already heading appeals urging schools to eradicate Wi-Fi from their facilities.

There are FOUR major shortcomings of wireless technologies:

- Health impacts
    - Physiological health (changes in the environment and biology)
    - Social health (increasing reliance on mobile devices for interaction and a lack of connection with the present)
    - Psychological health (wireless devices can cause functional impairments and change human behavior)
- Reliability
- Quality
- Safety

Don't believe that the FCC will protect you either – for many years, the government told us that tobacco and lead were perfectly safe – and the FCC doesn't even *deal* with health effects. Their job is to regulate electronic interference, not ensure your health or safety. An independent agency of the government, the FCC has the power to – in one fell swoop – remove barriers to harmful technologies with little, if any, accountability, has they have recently done with the opening of 5G frequencies for use by the wireless industry.

Tobacco, lead, and asbestos also present situations where the government advocated their safety and a serious body count was needed before policy was changed. Many renowned independent scientists from around the world agree that radiation from wireless devices is the next public health crisis; many spend much of their time appealing to governments and councils for changes in policy. Today, we are exposed to 100 million to 10 billion times more RF radiation than our grandparents were and 70% of non-industry funded peer-reviewed science has found this radiation to be biological hazardous. Tens of thousands of peer-reviewed studies have conclusively found that low-energy non-ionizing radiation (in particular, radiofrequency radiation, which consists of microwaves and radio waves) can lead to negative health implications in biological organisms. The science is being deliberately manipulated and obscured by both our elected officials and the industries that profit off of these technologies due to our ignorance.

No publication can encompass completely and accurate the full body of literature on this matter. This text aims to present some of the research on this issue, as well as testimonials, articles, and further resources for studies. Many excerpts are cited so that you can explore them further if necessary.

There are many hyperlinks in this publication. While some of them may display the URL for the linked resource, some do not. If you received a printed copy of this publication, you can access and download the electronic version of this publication anytime in order to access all hyperlinks, at the URL below:

https://wirelessaction.wordpress.com/irradiated/

This publication contains general information about medical conditions and treatments. The information presented herein does not constitute legal or medical advice, and should not be treated as such. If you have any specific questions about any medical matter you should consult your doctor or other professional healthcare provider. If you think you may be suffering from any medical condition you should seek immediate medical attention. Nothing in this disclaimer will limit any of our liabilities in any way that is not permitted under applicable law, or exclude any of our liabilities that may not be excluded under applicable law.

The Tip of the Truth

This section is a compilation of news articles, primary sources, and secondary resources, and includes original research, interpretations from qualified scientists in the field, and releases by both government and scientific bodies. All excerpts included are cited whenever possible. All excerpts are included in their original form, although some spelling and grammatical errors may have been corrected. Excerpts from external publications are not necessarily provided in any particular order.

Actual research is sprinkled throughout the entirety of this section, categorized depending on the nature or topic of the study; there is no separate section for scientific studies.

General

The EMF Controversy - Common Misconceptions

It is NOT a myth that EMF can have health effects. The World Health Organization has declared both powerline magnetic fields and radiofrequency fields to be a Group 2B possible carcinogen in the same category as lead and DDT. There are thousands of scientific studies on the biological effects of EMF. Below are some common misunderstandings which lead people to believe in the false dogma that nonionizing nonthermal radiation is safe.

An analysis of the scientific studies found that the majority of industry-funded studies found no effects, whereas the majority of independent studies did find effects. This is the same thing that had happened for the tobacco and lung cancer studies. It is important, therefore, not only to consider the conclusions of a study, but also its sources of funding.

The media typically presents an undecided viewpoint, one moment raising concerns, and the next moment saying that those concerns are unfounded. Stories are sometimes altered to soften the blow to the wireless industry. When Fortune magazine first reported on electromagnetic hypersensitivity in 1993, Motorola stopped advertising with Fortune magazine for a long time, resulting in hundreds of thousands of dollars of lost income, according to Microwave News. The media can also have a conflict of interest.

Similarly, the government suffers from a conflict of interest. The wireless industry is reported to be the government's #2 source of revenue, and has reportedly spent $2.3 billion in political lobbying. (*Public Health SOS, The Shadow Side of the Wireless Revolution*). Billions of dollars are paid for the allocation of the wireless spectrum.

Even health organizations like the World Health Organization suffer from conflicts of interest, and industry sometimes works to reverse judgments on the danger of electromagnetic fields. See Don Maisch's article, Conflict of Interest & Bias in Health Advisory Committees. Conflicts of interest can prevent health advisory bodies from sounding the alarm on health hazards.

Funding	Effect	No Effect
Industry	27 (32%)	57 (68%)
Non-Industry	96 (70%)	41 (30%)
Total	123 (56%)	98 (44%)

Source: Prof. Henry Lai, Univ. Washington
*(**Table from Dr. Martin Blank on Electromagnetic Fields**)*

There are many scientists who have had their funding or positions threatened because they found or spoke out on harmful effects from wireless radiation. These scientists include Henry Lai of University of Washington, Allan Frey, Robert Santini, Carl Blackman of the EPA, Ross Adey, Olle Johansson, Gerald Hyland, Olle Johansson, Annie Sasco, Dimitris J. Panagopoulos, and others. Although their credibility has been challenged, their findings have in many cases been reproduced by other scientists.

For example, Henry Lai, who found DNA effects in response to microwaves, was challenged and threatened. However, similar effects on DNA were later observed by the 7-nation European REFLEX study and by the University of Vienna. There is another interesting story shared by Devra Davis that the Adlkofer study was called a fraud in Science magazine, but that this story of fraud was later ruled to be a fraud itself. There are now approximately 11 studies now pointing towards DNA breaks.

Similarly, Allan Frey discovered blood-brain barrier leakage as a result of microwave radiation, which was challenged. However, Leif Salford expanded upon the work, and also showed that rodents' brain cells were dying as a result of microwave radiation.

Common Misconceptions

Common Misconceptions	**Did you know?**
***Myth*:** There is no consistent evidence that wireless radiation is harmful. ***Misleading*:** The weight of the evidence points towards no harm.	***Fact*:** While the majority of industry-funded studies do not find health effects, the majority of independent studies do. The same thing had happened for the Tobacco industry. Anyone studying the research must be careful to "follow the money trail." Read more below. Many of the adverse biological effects of wireless technologies have been confirmed by more than one scientific group, including DNA breaks, the increase of free radicals, and the opening of the blood brain barrier. These studies include high profile studies like the 7-nation European REFLEX study. Oftentimes, such findings are followed with an attempt to discredit the scientists involved. However, other scientists later confirm the findings. When we talk about the "weight of the evidence", we cannot just compare the number of studies finding an effect versus the number of studies not finding an effect. It's very easy in principle to design a study so that it does not find an effect, e.g., by limiting the time period of exposure and follow-up in the study, but this does not "balance out" the studies that do find an effect. See Study Design Variables which may be Manipulated by Science.
***Myth*:** Being classified as a Group 2B possible carcinogen is no reason for concern, because coffee is also a Group 2B carcinogen.	***Fact*:** While those concerned about EMF emphasize that radiofrequency radiation (RF-EMF) and extremely low frequency EMF (ELF-EMF) have been categorized by the World Health Organization/IARC as a Group 2B possible carcinogens, in the same category as lead, DDT, and chloroform, industry advocates on the other hand downplay the classification of EMF as a Group 2B possible carcinogen by reminding us that coffee is also a Group 2B carcinogen.

	In June 2016, that changed when the IARC removed coffee from the list of Group 2B carcinogens. Meanwhile, there are scientists who now believe EMF's should be considered a Group 2A probable carcinogen.
***Myth*:** Only ionizing radiation and thermal levels of microwaves can cause damage.	***Fact*:** There are now many studies showing biological effects from nonionizing nonthermal radiation. Recently, it became known that a large $25 Million NIH Cell Phone Radiation study found increased brain and heart tumors in rats after only 2 years of exposure to nonionizing radiation at nonthermal levels of exposure. See also a list of studies by power level. It is time to listen to the science, rather than sticking to outdated dogmas. There are thousands of studies. Multiple scientific studies have confirmed that wireless radiation can damage DNA (at least 11), and one possible mechanism is by increasing free radicals, which was also found in at least 24 scientific papers on wireless radiation. For more scientific mechanisms, refer to Genotoxic Effects and Cancer. Graham Philips explains that even for ionizing radiation, 25% of DNA breaks are caused by direct damage, but another 75% is caused by ionizing radiation's ability to form free radicals.
***Myth*:** Since cell towers, Wi-Fi, and cell phones are many times weaker than international safety standards, there is no reason for concern.	***Fact*:** International safety standards are still based upon the outdated dogma that only ionizing or thermal levels of radiation are dangerous. Because of that, they are in fact, at least 9000 times higher than levels at which science has demonstrated non-ionizing, nonthermal effects. Because cell towers, Wi-Fi, and cell phones exceed the radiation levels that science has demonstrated to cause biological effects, there is indeed reason for concern.
***Myth*:** Despite the rise of wireless technologies, brain cancer has not been on the increase.	***Fact*:** Studies that look at 10 or more years of use, such as the Leonnart Hardell studies and the Interphone study, do in fact show an increased risk of brain cancer. It has been reported that the heavy use category in the Interphone study included usage as little as 30 minutes a day. Studies that look at less than ten years are not looking long enough. Cancer from environmental causes often has latencies that take several decades. Dr. Devra Davis explains that it can take decades before cancer becomes apparent in the population. Compare an average of 2 decades for smoking

	and lung cancer. The worst is yet to come. She explains that widespread *heavy use* only began a few years ago. All the same, brain cancers are happening to people at much younger ages than before, and have been increasing in the last 10 years for young adults, in particular 20-29 year-olds. According to Leonnart Hardell's studies, children may have a risk that is much greater than adults. British neurosurgeon Kevin O'Neill, MD reports in April 2009 that brain tumors are increasing at approximately 2% per year (and in particular have doubled for his unit in the last year). See also what other neurosurgeons are saying. The Danish Cancer Registry indicates an increase in brain tumors between 2001 and 2010. Dr. Devra Davis also points out that there are other cancers besides brain cancer that may be related to cell phone use, such as salivary gland tumors, since the salivary gland is close to where the cell phone is held. Some women who keep their cell phones under their bras are finding breast tumors in precisely the spot where they put their cell phone. For more information, see the Environmental Working Group's Executive Summary.
***Myth*:** We've had TV and radio towers broadcast microwaves for years, and they have been safe..	***Fact*:** Epidemiological and survey studies find cancer & other health issues near TV and radio broadcasting towers in addition to cell towers. One of the latest high profile cases is the court-ordered epidemiological study for the Vatican radio tower and cancer. Increased risks of cancer were reported within a 5.5 mile radius. This large radius can be explained by the higher output power of radio/TV towers. In contrast, the critical range for a cell tower is usually within 400 meters. See calculations of power reduction with distance.
***Myth*:** We get more radiation from cosmic radiation than from wireless technologies..	***Fact*:** Cosmic microwave radiation is relatively negligible, (<0.000001 μW/m^2, MAES 2000) since the sources are so distant. Our exposures to manmade microwave radiation is thousands of times greater than the natural background levels. Even for ionizing radiation, radon in homes is said to be a greater source of ionizing radiation than cosmic radiation. Even at the EPA limit for radon of 4pCi/L, it has been compared to the equivalent of 200 chest X-rays a year. Local sources are usually a more significant concern than cosmic sources, which by the inverse square law, become less of a threat over distance.

***Myth*:** The wattage of a cell tower is not more than a light bulb, so it must be safe..	***Fact*:** Even though light and EMF are both frequencies of the electromagnetic spectrum, they have different characteristics, so we cannot use the safety standards that apply to light and apply them to EMF. For example, even though both water H_2O and hydrogen peroxide H_2O_2 are made of the same elements, they have completely different characteristics and thus different safety levels for ingestion. How is the light of an incandescent light bulb different from the EMF of wireless communications? Microwaves can penetrate walls that are opaque to light, and go right through our clothes and skin. Microwaves have also been shown to damage DNA, a fractal antenna, and increase free radical activity, but an incandescent lightbulb has no such effect. Therefore, we cannot use the wattage of a safe incandescent lightbulb to determine the level of safety of microwave EMF. They are simply different. There is also a recent study on electrosensitivity that suggests the on/off and off/on transitions may be responsible for biological effects. This pulsing signal, may also differentiate pulsed wireless radiation from a regular light bulb. It is interesting to note, however, that some people do in fact respond to light which flashes at a certain frequency, in a condition known as Photosensitive Epilepsy. This might also be why modulated wireless radiation may be more biologically active than umodulated wireless radiation. Devra Davis compares pulsing radiation to a car that lurches to a halt and then continues again, and then lurches to a halt again. This on-off-on-off sequence may be more disruptive than steady radiation, just as it is more disruptive to sit on a car that continually starts and lurches to a halt than one that is driving non-stop.
***Myth*:** The authorities say there is no known health effect at this time.. ***Myth*:** If it were dangerous, people would have known a long time ago..	***Fact*:** While not all authorities say there are health effects from wireless technologies, an increasing number of government health organizations are now calling for precautions in light of the growing scientific concerns. This is remarkable given the conflicts of interest. Industry-funded scientists have had their funding taken away when they found biological health effects, and industry has lobbied to reverse judgments on electromagnetic fields' danger. In the media, management sometimes intervenes

	because of advertisement money that is at stake. See Conflicts of Interest. Nevertheless, the truth is making its way into official government recommendations despite all the efforts to the contrary. In the last 5 years, many countries' governments have made wireless health recommendationscalling for precautions.
***Myth*:** Double-blind studies show that people who claim to be sensitive, cannot tell whether the signal is on or off.. Therefore, it must be a psychological "nocebo" effect -- Otherwise, it is a real, but unrelated health problem.	***Fact*:** In one study funded by industry, some of the most sensitive people in the double-blinded studies, were extremely accurate, but had to drop out of the study before its conclusion because of severe health issues. Many design flaws have also been pointed out in industry-funded double-blind studies. We are now beginning to see independent double-blind studies showing objective effects from EMF like arrhythmia and high blood pressure. Even animals, plants, and microbes are reacting to the radiation, and more than one in vitro study has found an increase in DNA double-strand breaks, which can lead eventually to cancer. Studies show that microwaves can open the blood-brain barrier and trigger arrhythmia in animals. These findings are not satisfactorily explained by psychology alone.

Study design is often manipulated in a way such that effects are not found. For example, children and heavy business users may be omitted from a study due to their increased vulnerability, or the study length is sometimes shortened, knowing that the average time lag can be over 10 years before cancer occurs. (For reference, the approximate time lag for lung cancer with respect to cigarette smoking is 20 years.) For more examples of study design flaws, see:

- Cellphones and Brain Tumors 15 Reasons for Concern: Science, Spin and the Truth Behind Interphone
- Interphone Brain Tumors Studies To Date: An Examination of Poor Study Design Resulting in an UNDER-ESTIMATION of the Risk of Brain Tumors.
- Why are epidemiologists (mis)leading us about cell phone radiation exposure?

For examples of deceptions in science, listen to an interview with Magda Havas, "Deceptions with Science", where she discusses deception through study design, interpretation, and presentation.

The following are some ways in which science can be manipulated:

- Defining a regular cell phone user as at least one call per week for at least 6 months (Interphone)--thus failing to study the difference between heavy users and light users. See "Heavy mobile users risk cancer".

- Reducing the time of the study, knowing that the normal latency for cancer is over a decade.
- Not controlling for other wireless exposures, such as DECT cordless phones, mobile phone base stations, and Wi-Fi. Users of these technologies may be counted as controls whereas in reality they are also exposed to Radiofrequency Radiation.
- Removing more vulnerable populations (business users in the Danish study, and children in Interphone). Business users are likely to be the heaviest users, and children are vulnerable for reasons mentioned in The Greater Vulnerability of Children.
- Only studying brain tumors and not other diseases (e.g., studies suggest higher salivary gland cancer risks, higher prostate cancer for men wearing mobile phones on their belt, symptoms related to infertility in men, and anecdotes are indicating breast cancer for women who hide their cell phone near their breasts).
- Testing with unmodulated wireless exposures when modulated wireless exposures are believed to be worse.
- Using sub-groups of animals or cell types with lower levels of susceptibility.
- Avoiding particular power density windows found in which calcium would be removed from brain tissue.
- Not taking into account different cell phones with different exposure levels.

Studies trying to disprove electrosensitivity often suffer from the following deficiencies:

- Insufficient population size and poor adherence of selection criteria as a result.
- Excluding subjects who had to drop out because of health reasons (they were made too ill to continue).
- Not properly accounting for the time lags between initial exposure and onset of symptoms, e.g., some symptoms last for days. Other symptoms take time to appear.
- Not taking into account the individualized nature of responses. It was found that different people may react to different signal types and power density levels with different symptoms, just as people react to allergens differently.
- Not controlling for other exposures such as power line magnetic fields and chemicals, which electrosensitive people sometimes suffer in addition to microwaves. The microwaves may even contribute to their weakened resistance.
- Not acknowledging that nocebo effects can happen, but do not disprove an effect. Similarly, placebo effects do happen, but do not disprove that a medicine really helps.
- Not acknowledging that survey studies do find that people are affected with subjective symptoms, even when they do not believe the cell tower is related Even people who do not think they are affected often show higher symptoms around wireless technologies, even though they cannot detect it.
- Not acknowledging the objective biological effects that have been found by scientific studies.

http://www.emfwise.com/myth.php

Non-industry studies vs industry studies show vast difference in the harmful effects of microwave radiation

March 17, 2017

We are drowning in a sea of electromagnetic pollution, and the scientific priesthood is determined to keep us in the dark about the threat of microwave radiation to our health, well-being, and survival. A handful of scientists are willing to speak up, and have risked everything to inform the world about it. Some refer to this EMF poisoning as covert electronic warfare, some call it genocide.

At the very least, vested interests tell us that microwave radiation exposure is not a health concern, when it really is. Stop The Crime website lists fifty symptoms of microwave radiation that includes memory loss, confusion, headaches, anxiety, depression, and suicide. With the pervasive use of mobile phones, wearable devices, Bluetooth, Wi-Fi, smart meters, smart appliances, hotspots, cellular towers, laptops, tablets, routers, cordless phones – we are being fried alive.

Conflicting conclusions show a clear bias against reporting the facts on microwaves

In a damning article Natural Blaze attempts to deconstruct the tangled mess of subterfuge that characterizes the issue of microwave safety: "If smart technology gadgets don't heat your skin, then they are safe, which is the standard 'tobacco science' pap disseminated by industrial professional societies such as IEEE, the American National Standards Institute (ANSI), the National Council of Radiation Protection (NCRP), and the International Commission on Non-Ionizing Radiation Protection (ICNIRP), who fund and/or perform the studies the World Health Organization and global government health agencies cite as 'factual' science. Basically, microwave technology industrial professional societies state emphatically there is no such effect as non-thermal radiation adverse health effects, which contribute to and/or cause electromagnetic hypersensitivity (EHS) or what physicians call idiopathic environmental intolerance (IEI) in sensitive people around the world."

Further, Natural Blaze reports that despite efforts at a cover-up, a significant one-third of industry studies do show harmful effects from microwave radiation beyond skin heating. Additionally, 70% of non-industry studies show definitive non-thermal damage to humans. Natural Blaze cites an article published in December 2016 by Sarah J. Starkey of Independent Neuroscience and Environmental Health Research, London, U.K. The article is entitled "Inaccurate official assessment of radiofrequency safety by the Advisory Group on Non-ionizing Radiation." Starkey writes:

"The microwave industry considers 'cancer' a four-letter-word and does everything within its financial and political prowess to disassociate anyone from proving or even associating cancer etiologies with microwave EMFs/RFs/ELFs, thermal and non-thermal wave radiation…The denial of the existence of adverse effects of RF fields below ICNIRP guidelines in the AGNIR report conclusions not supported by the scientific evidence."

Our genetic legacy, our children, should be listed as an endangered species

The most obscene aspect of this ever-present technology is the unrestrained proliferation of Wi-Fi in schools (the use of Wi-Fi is not even necessary; schools can be wired with telecommunication cables, as has been used for decades). If after exposure at school, children go home to another wireless environment, then they are exposed day and night. Children are more harmed by RF than adults; in essence we are destroying the future potential of our collective gene pool.

Damage to DNA and cancer result from oxidative stress, and microwaves cause oxidative stress. Due to widespread and growing use of wireless devices, microwave radiation is blanketing the entire planet, and all living things are at risk for genetic deterioration. The human tissue that is most vulnerable to the effects of microwave radiation is a fetus of under 100 days. Recall from your high school biology course that a baby girl is born with one to two million eggs; not yet matured, but nevertheless all present. Appallingly, this means that the full extent of the damage we are taking on today won't be apparent until it shows up in our grandchildren. Will we one day ask in mourning and disbelief, my God, what have we done?

http://newstarget.com/2017-03-17-non-industry-studies-vs-industry-studies-show-vast-difference-in-the-harmful-effects-of-microwave-radiation.html

Wireless radiation causes cancer, according to the latest scientific findings

The National Association for Children and Safe Technology (NACST) is calling on children's health and cancer prevention organizations to make the issue of children's exposure to wireless radiation in educational facilities a priority for 2015.

A 2014 study on wireless radiation, by the Hardell Group in Sweden, found a 3-fold risk with twenty-five years or more of cordless and cell phone use. Perhaps more worrying is the finding that people who first used cell or cordless phones before the age of twenty had the highest risk.

The science is clear: Cell phone use increases our risk of cancer

Another study by the same researchers found a correlation between wireless phone use and lower survival rates for people diagnosed with the most malignant form of brain tumor, gliomas. These two studies followed the CERENAT study which found that, "risks were higher for gliomas, temporal tumors, occupational and urban mobile phone use. "

The biggest wireless study carried out, the $25 million Interphone Study, found that: "regular use of a cell phone by adults can significantly increase the risk of gliomas by 40% with 1640 hours or more of use (this is about one half hour per day over ten years)." Given the established and emerging science, the NACST calls for students to be provided with a safe learning environment, free from wireless radiation.

The nation's schools are now rife with wireless exposures because, as the NACST states, "there has been a national movement to digitalize learning in our schools". The NACST points out these high exposures in classrooms are caused by:

- Industrial strength routers
- Thirty or more handheld devices or laptops – which all emit radiation

These exposures represent an unprecedented health risk to children because they are being exposed 6 hours a day, 5 days a week, for their entire school careers. This is in addition to their exposures outside of the educational setting, which given that most children now have cell phones and most homes are equipped with Wi-Fi is not inconsequential.

Children are more vulnerable than adults to the effects of wireless radiation for a variety of reasons:

- Their bodies are still developing and the impacts of chronic exposure to radiation are more profound.
- Research shows children absorb up to ten times more radiation than adults.
- Safe limits for children have never been established.

http://www.naturalhealth365.com/wireless-radiation-cancer-prevention-1316.html

Expressions of Concern from Scientists, Physicians, Health Policy Experts & Others

William Rea, MD

Founder & Director of the Environmental Health Center, Dallas
Past President, American Academy of Environmental Medicine
"Sensitivity to electromagnetic radiation is the emerging health problem of the 21st century. It is imperative health practitioners, governments, schools and parents learn more about it. The human health stakes are significant".

Martin Blank, PhD

Associate Professor, Department of Physiology and Cellular Biophysics,
Columbia University, College of Physicians and Surgeons; Researcher in Bioelectromagnetics; Author of the BioInitiative Report's section on Stress Proteins.
"Cells in the body react to EMFs as potentially harmful, just like to other environmental toxins, including heavy metals and toxic chemicals. The DNA in living cells recognizes electromagnetic fields at very low levels of exposure; and produces a biochemical stress response. The scientific evidence tells us that our safety standards are inadequate, and that we must protect ourselves from exposure to EMF due to power lines, cell phones and the like, or risk the known consequences. The science is very strong and we should sit up and pay attention."

Olle Johansson, Ph.D.

Associate Professor, The Experimental Dermatology Unit, Department of Neuroscience, Karolinska Institute, Stockholm, Sweden; Author of the BioInitiative Report's section on the Immune System.
"It is evident that various biological alterations, including immune system modulation, are present in electrohypersensitive persons. There must be an end to the pervasive nonchalance, indifference and lack of heartfelt respect for the plight of these persons. It is clear something serious has happened and is happening. Every aspect of electrohypersensitive peoples' lives, including the ability to work productively in society, have healthy relations and find safe, permanent housing, is at stake. The basics of life are becoming increasingly inaccessible to a growing percentage of the world's population. I strongly advise all governments to take the issue of electromagnetic health hazards seriously and to take action while there is still time. There is too great a risk that the ever increasing RF-based communications technologies represent a real danger to humans, especially because of their exponential, ongoing and unchecked growth. Governments should act decisively to protect public health by changing the exposure standards to be biologically-based, communicating the results of the independent science on this topic and aggressively researching links with a multitude of associated medical conditions."

David Carpenter, MD

Professor, Environmental Health Sciences, and Director, Institute for Health and the Environment, School of Public Health, University of Albany, SUNY
Co-Editor, The BioInitiative Report (www.BioInitiative.org)
Electromagnetic fields are packets of energy that does not have any mass, and visible light is what we know best. X-rays are also electromagnetic fields, but they are more energetic than visible light. Our concern is for those electromagnetic fields that are less energetic than visible light, including those that are associated with electricity and those used for communications and in microwave ovens. The fields associated with electricity are commonly called "extremely low frequency" fields (ELF), while those used in communication and microwave ovens are called "radiofrequency" (RF) fields. Studies of people have shown that both ELF and RF exposures result in an increased risk of cancer, and that this occurs at intensities that are too low to cause tissue heating. Unfortunately, all of our exposure standards are based on the false assumption that there are no hazardous effects at intensities that do not cause tissue heating. Based on the existing science, many public health experts believe it is possible we will face an epidemic of cancers in the future resulting from uncontrolled use of cell phones and increased population exposure to Wi-Fi and other wireless devices. Thus it is important that all of us, and especially children, restrict our use of cell phones, limit exposure to background levels of Wi-Fi, and that government and industry discover ways in which to allow use of wireless devices without such elevated risk of serious disease. We need to educate decision-makers that 'business as usual' is unacceptable. The importance of this public health issue can not be underestimated."

Magda Havas, PhD

Associate Professor, Environment & Resource Studies, Trent University, Canada.
Expert in radiofrequency radiation, electromagnetic fields, dirty electricity and ground current.
"Radio frequency radiation and other forms of electromagnetic pollution are harmful at orders of magnitude well below existing guidelines. Science is one of the tools society uses to decide health policy. In the case of telecommunications equipment, such as cell phones, wireless networks, cell phone antennas, PDAs, and portable phones, the science is being ignored. Current guidelines urgently need to be re-examined by government and reduced to reflect the state of the science. There is an emerging public health crisis at hand and time is of the essence."

Whitney North Seymour, Jr., Esq.

Retired Attorney; Former New York State Senator & United States Attorney, Southern District of NY
Co-Founder, Natural Resources Defense Council
"Electromagnetic radiation is a very serious human and environmental health issue that needs immediate attention by Congress. The BioInitiative Report is a major milestone in understanding the health risks from wireless technology. Every responsible elected official owes it to his or her constituents to learn and act on its finding and policy recommendations."

B. Blake Levitt

Former New York Times journalist and author of *Electromagnetic Fields*, A Consumer's Guide to the Issues and How to Protect Ourselves, and Editor of *Cell Towers, Wireless Convenience? Or Environmental Hazard?*
Ambient man-made electromagnetic fields (EMFs), across a range of frequencies, are a serious environmental issue. Yet most environmentalists know little about it, perhaps because the subject has been the purview of physicists and engineers for so long that biologists have lost touch with electromagnetism's fundamental inclusion in the biological paradigm. All living cells and indeed whole living beings, no matter what genus or species, are dynamic coherent electrical systems utterly reliant on bioelectricity for life's most basic metabolic processes. It turns out that most living things are fantastically sensitive to vanishingly small EMF exposures. Living cells interpret such exposures as part of our normal cellular activities (think heartbeats, brainwaves, cell division itself, etc.) The problem is, man-made electromagnetic exposures aren't "normal." They are artificial artifacts, with unusual intensities, signaling characteristics, pulsing patterns, and wave forms, that don't exist in nature. And they can misdirect cells in myriad ways. Every aspect of the ecosystem may be affected, including all living species from animals, humans, plants and even microorganisms in water and soil. We are already seeing problems in sentinel species like birds, bats, and bees. Wildlife is known to abandon areas when cell towers are placed. Radiofrequency radiation (RF)—the part of the electromagnetic spectrum used in all-things-wireless today—is a known immune system suppressor, among other things. RF is a form of energetic air pollution and we need to understand it as such. Humans are not the only species being affected. The health of our planet may be in jeopardy from this newest environmental concern—added to all the others. Citizens need to call upon government to fund appropriate research and to get industry influence out of the dialogue. We ignore this at our own peril now."

Eric Braverman, MD

Brain researcher, Author of *The Edge Effect*, and Director of Path Medical in New York City and The PATH Foundation. Expert in the brain's global impact on illness and health.
"There is no question EMFs have a major effect on neurological functioning. They slow our brain waves and affect our long-term mental clarity. We should minimize exposures as much as possible to optimize neurotransmitter levels and prevent deterioration of health".

Abraham R. Liboff, PhD

Research Professor
Center for Molecular Biology and Biotechnology
Florida Atlantic University, Boca Raton, Florida
Co-Editor, Electromagnetic Biology and Medicine
"The key point about electromagnetic pollution that the public has to realize is that it is not necessary that the intensity be large for a biological interaction to occur. There is now considerable evidence that extremely weak signals can have physiological consequences. These interactive intensities are about 1000 times smaller than the threshold values formerly

estimated by otherwise knowledgeable theoreticians, who, in their vainglorious approach to science, rejected all evidence to the contrary as inconsistent with their magnificent calculations. These faulty estimated thresholds are yet to be corrected by both regulators and the media.

The overall problem with environmental electromagnetism is much deeper, not only of concern at power line frequencies, but also in the radiofrequency range encompassing mobile phones. Here the public's continuing exposure to electromagnetic radiation is largely connected to money. Indeed the tens of billions of dollars in sales one finds in the cell phone industry makes it mandatory to corporate leaders that they deny, in knee-jerk fashion, any indication of hazard.

There may be hope for the future in knowing that weakly intense electromagnetic interactions can be used for good as well as harm. The fact that such fields are biologically effective also implies the likelihood of medical applications, something that is now taking place. As this happens, I think it will make us more aware about how our bodies react to electromagnetism, and it should become even clearer to everyone concerned that there is reason to be very, very careful about ambient electromagnetic fields."

Lennart Hardell, MD, PhD

Professor at University Hospital, Orebro, Sweden.
World-renowned expert on cell phones, cordless phones, brain tumors, and the safety of wireless radiofrequency and microwave radiation.
Co-authored the BioInitiative Report's section on Brain Tumors by Dr. Hardell
"The evidence for risks from prolonged cell phone and cordless phone use is quite strong when you look at people who have used these devices for 10 years or longer, and when they are used mainly on one side of the head. Recent studies that do not report increased risk of brain tumors and acoustic neuromas have not looked at heavy users, use over ten years or longer, and do not look at the part of the brain which would reasonably have exposure to produce a tumor."

Samuel Milham MD, MPH

Medical epidemiologist in occupational epidemiology.
First scientist to report increased leukemia and other cancers in electrical workers and to demonstrate that the childhood age peak in leukemia emerged in conjunction with the spread of residential electrification.
"Very recently, new research is suggesting that nearly all the human plagues which emerged in the twentieth century, like common acute lymphoblastic leukemia in children, female breast cancer, malignant melanoma and asthma, can be tied to some facet of our use of electricity. There is an urgent need for governments and individuals to take steps to minimize community and personal EMF exposures."

Libby Kelley, MA

Managing Secretariat International Commission For Electromagnetic Safety; Founder, Council on Wireless Technology Impacts; Co-Producer of documentary, "Public Exposure: DNA, Democracy and the Wireless Revolution"; EMF environmental consultant and leading appellant in challenging the FCC Radio Frequency Radiation human exposure guidelines, 1997-2000. (www.icems.eu)
"Radiofrequency radiation human exposure standards for personal wireless communications devices and for environmental exposure to wireless transmitters are set by national governments to guide the use of wireless communications devices and for wireless transmitters. In the U.S., the Food and Drug Administration and the Federal Communications Commission set these standards. The Council on Wireless Technology Impacts considers these exposure standards to be inadequate as they are based on heating effects and do not accommodate the low level, cumulative exposure conditions in which the public now lives. These standards are also designed for acute, short term exposure conditions and do not acknowledge the medical evidence pointing to increased risks and actual harm that results from chronic, intermittent exposure. Federal and State public heath agencies are not officially addressing what many concerned scientists and medical doctors now see as an emerging public health problem. There are no health surveillance or remedial response systems in place to advise citizens about electromagnetic radiation exposure (EMR). As wireless technology evolves, ambient background levels increase, creating electrical pollution conditions which are becoming ubiquitous and more invasive. We strongly encourage consumers, manufacturers, utility providers and policymakers to reduce, eliminate and mitigate EMR exposure conditions and to support biologically based standards."

James S. Turner, Esq.

Chairman of the Board, Citizens for Health
Co-author, *Voice of the People: The Transpartisan Imperative in American Life*
Attorney, Swankin-Turner, Washington, DC

"*According to the BioInitiative Report: A Rationale for a Biologically-Based Public Exposure Standard for Electromagnetic Fields*—from electrical and electronic appliances, power lines and wireless devices such as cell phones, cordless phones, cellular antennas, towers, and broadcast transmission towers—we live in an invisible fog of EMF which thirty years of science, including over 2,000 peer reviewed studies, shows exposes us to serious health risks such as increased Alzheimer's disease, breast cancer, Lou Gehrig disease, EMF immune system hypersensitivity and disruption of brain function and DNA. The public needs to wake up politicians and public officials to the need for updating the decades old EMF public health standards. This report tells how."

Camilla Rees, MBA

CEO, Wide Angle Health, LLC
Patient education and advocacy

"The U.S. spends over $2 trillion dollars on health care each year, of which about 78% is from people with chronic illnesses, without adequately exploring and understanding what factors—including EMF/RF—contribute to imbalances in peoples' bodies' in the first place. After reading The BioInitiative Report, it should come as no surprise to policymakers, given the continually increasing levels of EMF/RF exposures in our environment, that close to 50% of Americans now live with a chronic illness. I grieve for people who needlessly suffer these illnesses and hold out the hope that our government leaders will become more cognizant of the role electromagnetic factors are playing in disease, health care costs and the erosion of quality of life and productivity in America."

L. Lloyd Morgan, BS Electronic Engineering

Director Central Brain Tumor Registry of the United States, Member Bioelectromagnetics Society, Member Brain Tumor Epidemiological Consortium *

"There is every indication that cell phones cause brain tumors, salivary gland tumors and eye cancer. Yet, because the cell phone industry provides a substantial proportion of research funding, this reality is hidden from the general public. The Interphone Study, a 13-country research project, substantially funded by the cell phone industry has consistently shown that use of a cell phone protects the user from risk of a brain tumor! Does anything more need to be said? It is time that fully independent studies be funded by those governmental agencies whose charter is to protect its citizens so that the truth about the very damaging health hazards of microwave radiation becomes clear and well known."

**For identification purposes only: All statements are mine and mine alone and do not represent positions or opinions of the Central Brain Tumor Registry of the United States, the Bioelectromagnetics Society or the Brain Tumor Epidemiological Consortia.*

Janet Newton

President, The EMR Policy Institute
www.EMRPolicy.org

"The radiofrequency radiation safety policy in force in the United States fails to protect the public. Currently in the US there are more than 260 million wireless subscribers, the demand that drives the continuing build-out of antenna sites in residential and commercial neighborhoods, including near schools, daycare centers, and senior living centers and in the workplace. The January 2008 report issued by the National Academy of Sciences committee whose task was to examine the needs and gaps in the research on the biological effects of exposure to these antennas points out that the research studies to date do not adequately represent exposure realities. Specifically, the studies 1) assume a single antenna rather than the typical arrangements of a minimum of four to six antennas per site, thereby underestimating exposure intensities, 2) do not pertain to the commonly used multiple-element base station antennas, thereby not taking into account exposures to multiple frequencies, 3) lack models of several heights for men, women, and children of various ages for use in the characterization of Specific Absorption Rate (SAR) distributions for exposures from cell phones, wireless PCs, and base stations and 4) do not take into consideration absorption effects of exposures from the many different radio frequency

emitting devices to which the public is often simultaneously exposed. A federal research strategy to address these very serious inadequacies in the science on which our government is basing health policy is sorely needed now."

Prof. Livio Giuliani, PhD

Spokesperson, International Commission for Electromagnetic Safety (www.icems.eu)
Deputy Director, Italian National Institute for Worker Protection and Safety, East Venice and South Tyrol; Professor, School of Biochemistry of Camerino University, Italy

The Venice Resolution, initiated by the International Commission for Electromagnetic Safety (ICEMS) on June 6, 2008, and now signed by nearly 50 peer reviewed scientists worldwide, states in part, "We are compelled to confirm the existence of non-thermal effects of electromagnetic fields on living matter, which seem to occur at every level of investigation from molecular to epidemiological. Recent epidemiological evidence is stronger than before. We recognize the growing public health problem known as electrohypersensitivity. We strongly advise limited use of cell phones, and other similar devices, by young children and teenagers, and we call upon governments to apply the Precautionary Principle as an interim measure while more biologically relevant exposure standards are developed."

Professor Jacqueline McGlade

Executive Director, European Environmental Agency
Advisor to European Union countries under the European Commission

"There are many examples of the failure to use the precautionary principle in the past, which have resulted in serious and often irreversible damage to health and environments. Appropriate, precautionary and proportionate actions taken now to avoid plausible and potentially serious threats to health from EMF are likely to be seen as prudent and wise from future perspectives."

Paul J. Rosch, MD

Clinical Professor of Medicine and Psychiatry, New York Medical College; Honorary Vice President International Stress Management Association; Diplomate, National Board of Medical Examiners; Full Member, Russian Academy of Medical Sciences; Fellow, The Royal Society of Medicine; Emeritus Member, The Bioelectromagnetics Society

Claims that cell phones pose no health hazards are supported solely by Specific Absorption Rate (SAR) limits safety standards written by the telecommunications industry decades ago based on studies they funded. These have made the erroneous assumption that the only harm that could come from cell phone radiofrequency emissions would be from a thermal or heating action, since such non thermal fields can have no biological effects. The late Dr. Ross Adey disproved this three decades ago by demonstrating that very similar radiofrequency fields with certain carrier and modulation frequencies that had insufficient energy to produce any heating could cause the release of calcium ions from cells. Since then, numerous research reports have confirmed that non thermal fields from cell phones, tower transmitters, power lines, and other man made sources can significantly affect various tissues and physiologic functions.

We are constantly being bathed in an increasing sea of radiation from exposure to the above, as well as electrical appliances, computers, Bluetooth devices, Wi-Fi installations and over 2,000 communications satellites in outer space that shower us with signals to GPS receivers. New WiMax transmitters on cell phone towers that have a range of up to two square miles compared to Wi-Fi's 300 feet will soon turn the core of North America into one huge electromagnetic hot spot. Children are more severely affected because their brains are developing and their skulls are thinner. A two-minute call can alter brain function in a child for an hour, which is why other countries ban their sale or discourage their use under the age of 18. In contrast, this is the segment of the population now being targeted here in a $2 billion U.S. advertising campaign that views "tweens" (children between 8 and 12 years old) as the next big cell phone market. Firefly and Barbie cell phones are also being promoted for 6 to 8-year-olds.

It is not generally appreciated that there is a cumulative effect and that talking on a cell phone for just an hour a day for ten years can add up to 10,000 watts of radiation. That's ten times more than from putting your head in a microwave oven. Pregnant women may also be at increased risk based on a study showing that children born to mothers who used a cell phone just two or three times a day during pregnancy showed a dramatic increase in hyperactivity and other behavioral and emotional problems. And for the 30% of children who had also used a cell phone by age 7, the incidence of behavioral problems was 80% higher! Whether ontogeny (embryonic development) recapitulates phylogeny is debatable, but it is clear that lower forms of life are also much more sensitive. If you put the positive electrode of a 1.5 volt battery in the Pacific

Ocean at San Francisco and the negative one off San Diego, sharks in the in between these cities can detect the few billionths of a volt electrical field. EMF fields have also been implicated in the recent massive but mysterious disappearance of honeybee colonies essential for pollinating over 90 commercial crops. As Albert Einstein warned, "If the bee disappeared off the surface of the globe, then man would only have four years of life left."

Finally, all life on earth evolved under the influence of solar radiation and geomagnetic forces that we have learned to adapt to and in some instances even utilize. The health of all living systems (ranging upward from a cell, tissue, organ or person, to a family, organization or nation) depends on good communication – good communication within, as well as with the external environment. All communication in the body eventually takes place via very subtle electromagnetic signaling between cells that is now being disrupted by artificial electropollution we have not had time to adapt to. As Alvin Toffler emphasized in Future Shock, too much change in too short a time produces severe stress due to adaptational failure. The adverse effects of electrosmog may take decades to be appreciated, although some, like carcinogenicity, are already starting to surface. This gigantic experiment on our children and grandchildren could result in massive damage to mind and body with the potential to produce a disaster of unprecedented proportions, unless proper precautions are immediately implemented. At the same time, we must acknowledge that novel electromagnetic therapies have been shown to benefit stress related disorders ranging from anxiety, depression and insomnia, to arthritis, migraine and tension headaches. As demonstrated in Bioelectromagnetic Medicine, they may also be much safer and more effective than drugs, so we need to avoid throwing the baby out with the bathwater."

Scientist replies to Quebec opinion on RF health impacts

30 Jan 2017

Ten years ago, in 2006, a report from the Quebec National Institute of Public Health (Institut national de santé publique du Québec – INSPQ) recommended "to set up a task force grouping the main organizations concerned with this issue (…)" in order to evaluate and propose, if deemed necessary, reasonable and proportionate electromagnetic fields (EMFs) mitigation measures in Quebec.

The 2006 report states : "The proposed approach will be based on the terms of reference in the management of health risks of the INSPQ which advocates the reduction and elimination of risks both in a context of relative uncertainty and one of scientific uncertainty" (bold type is mine). I don't know if the task force was created, but ten years later, the INSPQ released another report entitled Évaluation des effets sur la santé des champs électromagnétiques dans le domaine des radiofréquences (Evaluation of the health effects of the electromagnetic fields in the radio frequency field). This report includes reviews of scientific studies and individual studies, along with positions of international agencies regarding standards of exposure to electromagnetic fields. The authors, Mathieu Gauthier and Denis Gauvin, clearly relegate to oblivion the precautionary principle which the 2006 report highlighted: "The Institut national de santé publique du Québec (INSPQ) also considers that the Government of Quebec should develop a policy that ensures the application of the precautionary approach regarding exposure to EMFs."

What logic led to the choice of the included studies?

The report published in the Spring of 2016 includes literature reviews and studies mainly published between 2009 and 2013.The authors conclude that "even if the limits of current research do not exclude any possibility of risks, no harmful effects on health in the short or long term have been shown for exposure to radiofrequencies (RFs) within the established limits" (bold type is mine).

The authors mention, however, that they have revised some "important publications produced until 2015". The list of references shows they also retained some studies published prior to 2009, including several co-authored by Denis Gauvin (first author of the 2006 report). The logic behind the choice of texts is really not obvious, and this reference list leaves me unsatisfied. Being concerned by EMFs health effects for the last two years, particularly with respect to possible biological effects related RF exposure from mobile phone antennas, I have noted an increase in the number of studies on the effects of EMFs published in recent years in peer-reviewed scientific journals. About half of the documents retained by the authors of the INSPQ report comes from international organizations such as the WHO (World Health Organization) and the ICNIRP (International Commission on Non-Ionizing Radiation Protection), including some from government agencies such as Industry Canada, the wireless industry, the Canadian Wireless Telecommunications Association and the International Communications Union. The other half is composed of reviews or individual studies that are, again, a small sample of what has been published own this field since 2009.

Moreover, I find it strange that instead of including a larger number of studies, which would have given their report more weight, the authors preferred including several articles by the same authors, for example Frei, Baliatsas, Joseph, Röösli, Rubin, who generally deny the existence of harmful biological effects from RFs. I also noticed that these authors often co-author the same articles (ex: Röösli and Frei, Röösli and Joseph, Joseph, Frei and Röösli, Baliatsas and Rubin). The INSPQ report does not specify the

selection criteria for the studies, merely saying: "This report analyzes primarily studies published between 2009 and 2013." No details on the type of studies selected, for instance. It's up to the readers to judge!

The thermal effect of microwaves: not the only type of effects to consider!
However, I liked the second chapter of the report, which explains what are radio frequencies, how we measure them, etc. I found explanations clear because this chapter helps to understand what it is. But the good news ends at this point. If the rest of the report is well written and well structured, it remains that the entire argument is built in reference to organizations such as Health Canada that totally deny that RFs can have harmful biological effects, with the exception of the WHO, which remains very cautious, however. This argument is based on the studies selected, which do not reflect the overall state of science on the subject.

When an international body such as ICNIRP, which establishes guidelines to limit RF exposure, relies on the sole basis of thermal effects (heating of tissue), it is an aberration. This is notably denounced by several scientists and Canadian Physicians concerned by the biological effects of RFs and also, in 2015, by the Canadian Legislature's Standing Committee of Health, whose report is not mentioned by Gauthier and Gauvin. This aberration, which leads to deny the bioeffects RF exposure levels well below limits recommended by Canada's Safety Code 6, is also endorsed by the Institute of Electrical and Electronic Engineers.

Countries taking precautions ignored or ridiculed
In addition, the authors of the report hardly mention that in 20 countries (especially in Europe), various levels of governments have adopted measures based on the precautionary principle, particularly to limit the RF exposure of vulnerable populations or the general public. France, for example, recently banned the use of Wi-Fi connections in daycares and kindergartens, and limits their use in elementary schools.

The authors of the INSPQ report prefer mentioning only two countries that adopted a more cautious approach than ours: Russia and Italy. They point out, though, that the research carried out in Russia on the immune system was published a long time ago (20 to 40 years) and that studies were made in 'medieval' times (the term is mine) with respect to laboratory techniques and standards of quality in experimental research. It's a harsh judgment to make about a country where scientists pioneered studies on the bioeffects of microwaves in the 1960s.

As well, Gauthier and Gauvin quote ANSES, the French Agency for Food, Environmental and Occupational Health and Safety, which stated that Italy's stricter RF exposure limits lack any scientific basis. They also claim that this cautious approach gives Italians cause to worry, and that the adoption of such an approach undermines "public trust in scientifically established standards." So much for the precautionary principle! It seems that neglecting this internationally-recognized principle is preferable to considering it!

Studies linking RF exposure and cancer criticized or ignored
While the INSPQ report also includes some studies linking exposure to RF to biological effects, it hastens to downplay their results and scope, and forgets to mention other studies establishing the same link. For example, the authors write about a Brazilian study that compares, for the city of Belo Horizonte, the location of cancer deaths and those of mobile phone base stations (towers/antennas). The authors discovered a strange similarity between the two: the location of "cancer clusters" reveals a much higher

mortality rate within 500 meters of cell towers. Gauthier and Gauvin downplays these findings by saying "methodological weaknesses of this study limit its conclusions". What methodological weaknesses? They don't specify. And they make sure to omit studies revealing similar results, for example a German study published in 2004. Its authors examined the medical records (dating between 1994 and 2004) of 1,000 patients of four physicians practicing in the same municipality, or 90% of its population. They found cancer rates triple among people living within 400 meters of base stations during that decade, compared to those living further away. On average, the patients living in the 400 m zone developed cancer eight years younger than the control group. The increase in cancer cases appeared only five years after the base stations were commissioned, and the authors believe the true cancer rate is probably underestimated because theeir study excluded older patients.

Scientists the report did not like

I don't understand why the INSPQ report excluded papers from scientists such as Martin Pall, a professor emeritus of biochemistry and sciences at Washington State University (United States). Pall explains an important mechanism involved in microwaves's biological effects. I also wonder why studies published in 2013, 2014 and 2015 by a prominent Swedish scientist Lennart Hardell, who authored several pioneering cell phone/cancer studies since 1999, were also excluded. Could it be because Hardell and his colleague Carlberg, in their most recent analysis, confirmed the link between cell phone or cordless phone radiation and gliomas (a rare but deadly type of brain cancer)? Or is it because, in a very detailed letter dated August 4th 2015, Hardell and Carlberg explained to WHO why it should update the current classification of RFs to include them in Category 1, "Carcinogenic to humans"?

Several individual studies and pooled analyses have been published on the noxious effects of mobile phone base stations. For example, a cohort study that followed subjects for 6 years concluded that RF exposure affects the pituitary and adrenal glands by decreasing levels of hormones (ACTH cortisol, thyroid hormones, prolactin in women and testosterone). For its part, the paper by Abdel Rassoul and colleagues, published in 2007 in Neurotoxicology, concluded that people living in the vicinity of cell towers/antennas are significantly more at greater risk of developing neuropsychiatric problems (headaches, dizziness, tremors, symptoms of depression, memory problems and sleep disorders). This study concludes that their neurobehavioral performance was poorer than that of the control group.

Noteworthy is a review of ten epidemiological studies by Khurana and colleagues, published in 2010 by the International Journal of Occupational and Environmental Health. The authors concluded that eight out of ten studies on the long-term effects of RF exposure within 500 m of cell phone base stations showed an increase in neurobehavioral symptoms or in cancer. Yet it was also excluded from INSPQ's report!

While some papers published after 2013 were mentioned in the INSPQ report, it overlooks a French study of 727 subjects (Dominique Belpomme, 2015) which found that patients diagnosed as bona fide electrohypersensitive had abnormal blood and urine marker levels (histamine, melatonin, stress proteins, vitamin D, etc.) and poor cerebral vascularisation in ultrasound imaging.

INSPQ must value the precautionary principle once again!

I could quote several other studies highlighting RF bioeffects that were ignored by Gauthier and Gauvin, including research on cells and animals. But I will conclude by saying that globally denying such effects based on a limited study sample invalidates the results of the report, even if it concludes that scientific "uncertainty" persists in this area.

If the question of RF health effects was only controversial, one might wonder if "the reduction and elimination of risks both in a context of relative uncertainty and one of scientific uncertainty" (INSPQ 2006 report) was truly considered by the authors of the 2016 report. I doubt it was because, in the few recommendations they make, there is no mention of the precautionary principle which is the main focus of the 2006 report.

It would be wise to adopt this principle regarding the use and development of wireless equipment, notably because in their 2016 report abstract, the authors admit that there is still "some scientific uncertainty about long term exposure to cell phones". A change of attitude by INSPQ is urgent. It is the health of our population that is at stake here.

https://maisonsaine.ca/sante-et-securite/electrosmog/scientist-replies-to-quebec-opinion-on-rf-health-impacts.html

Over 2,000 Studies Confirm TOXIC Effects of EMF From Cell Phones and Household Appliances

All electrical appliances and wiring in your home emit EMFs: Electrical Magnetic Fields.

Electromagnetic Radiation is a form of energy that can cause changes in the space surrounding electronic devices. The invisible fields impacts your cells and can cause debilitating health effects. In modern homes, this kind of radiation is ever-present (1).

These fields are linked to cancer, reproductive malfunction, cataracts and changes in behavior in children (2). This is because all types of EMFs react with your DNA (3).

Other health effects include (4):

- Blood cells damage
- Nerve damage
- Elevated risk of autism and Alzheimer's
- Eye & ear damage
- Sleep disruption
- Headaches
- Salivary gland tumors
- Decreased bone density
- Electromagnetic hypersensitivity
- Abnormal heart rate
- Unstable blood pressure
- Seizures

In 2007, the Bioinitiative Working Group, an international collaboration of scientists and public health experts from the Austria, China, Denmark, Sweden and the United States, released a 650-page report which cites more than 2,000 studies that chronicle the toxic effects of EMFs.

They found that chronic exposure to even low-level radiation can cause a variety of cancers, impair immunity, and contribute to Alzheimer's disease and dementia, heart disease, and many other ailments (4).

The number of studies published on the subject have now reached 8,000.

In fact, the World Health organization has even classified radio frequency radiation as "possibly carcinogenic" to humans and the IARC has classified radiofrequency electromagnetic fields as the same.

As it stands, multiple studies link these kind of radiation to increased instances of childhood leukemia and brain tumors. The younger you are when you're exposed to EMFs, the more likely you are to develop these health conditions (5).

And while many countries have yet to instill protective measures to keep their citizens safe, nearly all developed nations have documented the phenomena.

In 2001, Sweden even recognized Electromagnetic Hypersentistivity (EHS) as a functional impairment. The country estimated that over 3% of the population experiences severe symptoms related to EMF exposure. In other developed nations, this number fluctuates between 3-8%.

And that's not all, another 35-50% of the population experiences these symptoms moderately. The World Health Organization now recognizes the condition as a growing world health concern (6).

Nowadays, many schools are equipped with computers, tablets and smart boards meant to facilitate learning. Unfortunately, these new technologies used in schools are increasing EMF exposure for students and personnel.

In one California school, these technologies began taking a toll of the health of its teachers. In 1990, sixth-grade teacher named Gayle Cohen found that the onset of technology in her classroom left her and her colleges feeling weak and dizzy (7).

For months she struggled to understand the connection between her fatigue and the environment in her classroom. However, just a few years after the arrival of the computers, one of her fellow teachers developed cancer and died.

It wasn't long before another colleague was diagnosed with throat cancer. As the years went by, more faculty members and students developed strange diseases. Eventually, Cohen was diagnosed with breast cancer.

"That's when I sat down with another teacher, and we remarked on all the cancers we'd seen," she says. "We immediately thought of a dozen colleagues who had either gotten sick or passed away."

In just 15 years, 16 staff members among the 137 who'd worked at the new school had been diagnosed with 18 cancers. This ratio was 3 times higher than average. Additionally, a dozen cancers had been detected in former students. Some had even died from the disease.

When EMF levels were examined by Sam Milham, MD, an epidemiologist, he found that the the surges of transient pollution exceeded his meter's ability to gauge them.

this led to a complaint filed to the Occupational Safety and Health Administration, which in turn lead to a full investigation by the California Department of Health Care Services.

The result was shocking: exposure to the fields in Cohen's school increased the likelihood a teacher would develop cancer by 64%. In just the first year of working with computers in her classroom, Cohen had increased her risk of cancer by 21%. That's not all, the faculty member's risks of developing melanoma, thyroid cancer, and uterine cancer were up to 13 times higher than the national average.

https://dailyhealthpost.com/emf-radiation-dangers/

Study Proves Microwave Radiation Directly Affects Your Heart

Have you ever wondered why some restaurants post warning signs for customers with pacemakers that the establishment uses a microwave oven?

A pacemaker is an electrical device implanted in the chest to maintain proper heart rhythm. Microwaves can interfere with the electrical impulses of the pacemaker.

The human heart is also an electrical device that naturally maintains the appropriate rhythm. Microwave radiation has the same effect on the real organ as it does on the plastic implant.

Dr. Magda Havas of Trent University in Ontario has conducted several studies on the effects of microwave radiation in the human body. Her 2010 study began with the question, "Does radiation from a cordless phone affect the heart?"

She and her colleagues tested the effects of 3 minutes of exposure from a common cordless telephone running at 2.4 GHz (gigahertz) with 25 people. Forty percent of the subjects experienced changes to their heart rate.

Her conclusion:"arrhythmia, heart palpitations, heart flutter, or rapid heartbeat and/or vasovagal symptoms such as dizziness, nausea, profuse sweating and syncope when exposed to electromagnetic devices. It is the first study to demonstrate such a dramatic response to pulsed MW [microwave] radiation at 0.5% of existing federal guidelines (1000 microW/cm^2) in both Canada and the US." (1)

A cordless telephone uses about 3 watts of power. Microwave ovens work at 2.5 GHz frequency but are run with the power of 1000 watts. Hence, the harmful effects of microwave ovens are all too real for patients with pacemakers.

Havas' subsequent study in 2013 expanded the research into "electrosmog", the miasma of electromagnetic radiation emitted by wireless technology that constantly surrounds us. Devices that contribute to electrosmog are cell phones, smart meters, wireless routers, baby monitors, computers, gaming consoles, radios, television, and the like.

Electrohypersensitivity is the term used for the vast number of people who experience debilitating physical consequences from exposure to radio frequency (microwave) emissions—it is also called "rapid aging syndrome". That doesn't sound very appealing.

The most common symptoms experienced by the subjects involved in the study were:

- Fatigue
- Sleep disturbance
- Headaches
- Feeling of discomfort
- Difficulty concentrating
- Depression
- Memory loss
- Visual disruptions
- Irritability
- Hearing disruptions
- Skin problems

- Cardiovascular
- Dizziness
- Loss of appetite
- Movement difficulties
- Nausea

Electrosmog affects the blood, heart, and entire autonomous nervous system. The closer the source of the radiation, the more severe and chronic the effects. Any one device wouldn't be a problem but we are bombarded with this radiation virtually everywhere.

"EHS [electrohypersensitivity] may be viewed as a contentious issue, yet a growing number of international experts, scientists, and medical doctors have been asking governments and international agencies for decades to lower existing guidelines for RF [radio frequency] radiation because the current guidelines do not protect public health…The information provided in this article is not new. Reviews as far back as 1969 summarized the effects of microwave radiation and identified many of the same symptoms." (2)

Microwave ovens aren't wireless—they require too much power for that. But the type of radiation used to cook food is the same as the kind used to make a call. The danger they present isn't from the oven itself but microwaved foods.

A microwave oven works by flooding food with electromagnetic radiation; the molecular structures of the food are changed by the radiation. When we eat food cooked (or even warmed) by microwaves, our physiology changes too.

In fact, microwave ovens were banned in Russia after results of extensive research found (among other things):

- Cooking vegetables with microwave radiation releases free radicals (which, as we know, cause cancer)
- Degeneration of immune responses due to a compromised lymphatic system
- Significant decreases in the nutritional value of all foods cooked in this way
- Changes in how sugars break down
- Molecular changes in foods caused digestive disorders, including stomach and intestinal cancer
- Proteins were broken down into abnormal formations (3)

Still not convinced? Consider this from a forensic review of 28 studies performed in different countries of the effects of microwaved food in humans:

"From the twenty-eight above enumerated indications, the use of microwave apparatus is definitely not advisable…Due to the problem of random magnetic residulation and binding within the biological systems of the body…which can ultimately effect the neurological systems, primarily the brain and neuroplexuses (nerve centers), long term depolarization of tissue neuroelectric circuits can result. Because these effects can cause virtually irreversible damage to the neuroelectrical integrity of the various components of the nervous system (I. R. Luria, Novosibirsk 1975a), ingestion of microwaved foods is clearly contraindicated in all respects." (4)

https://dailyhealthpost.com/microwave-oven/

Press Release by the Health Protection Agency on 15th Sept 2009 entitled "Scientist probe laptops Wi-Fi Emissions.

Comments by Andrew Goldsworthy on 20th Sept 2009

The following quote from the notes to editors is muddled and deeply misleading. "There is no consistent evidence to date that exposure to RF signals from Wi-Fi and WLANs adversely affect the health of the general population". It is muddled because it confuses two completely separate issues.

1. Is there any evidence that Wi-Fi is harmful to health? The answer to this is DEFINITELY YES.
2. Is the whole population affected? The answer to this is SEEMINGLY NOT.

It is misleading because it is written in such a way as to imply that Wi-Fi is safe for EVERYONE and there is no reason why it should not be used universally in schools. What about the health of the students and staff who are affected? Do they not care?
The use of the word "consistent" in the quote is also worrying since it suggests that physicists and engineers, possibly from the mobile phone and Wi-Fi industries, rather than biologists and health experts, are in control.

No trained biologist or medical practitioner would ever expect the same level of consistency from experiments with complex living organisms as is possible with simple physical systems.
Apart from identical twins, each one of us is genetically and physiologically unique and we do not all respond in the same way to metabolic insults. Not everyone who smokes dies of cancer, and we do not all suffer the same side effects from taking a medicinal drug. Even the same person may not be equally susceptible all of the time. For example, if we are ill, our resistance to further infections is usually lowered. Anyone who says that we must all show the same response to electromagnetic radiation before its effects can be regarded as real must have a very limited knowledge of biology. They are certainly not qualified to sit in judgment on important health issues that are likely to affect billions of people worldwide, let alone the health of unsuspecting UK school children and staff who have no choice.

Not every country agrees on the Safety Guidelines
The press release is also misleading when it says that the electromagnetic radiation from wireless laptops and mobile phones fall within internationally agreed Safety Guidelines. It says nothing about the fact that THESE GUIDELINES ARE NOT UNIVERSALLY AGREED and many other countries such as Russia, China, Italy, Switzerland and the USA (i.e. much of the industrialized world) are much more cautious than the UK, and set their safety limits between ten and one thousand times lower (www.bioinitiative.org).

These guidelines do not include non-thermal effects
The guidelines that the UK Health Protection Agency refers to are based on those proposed by ICNIRP, using research that is at least a decade out of date. In particular, they make the assumption that the only way that non-ionizing radiation can damage living cells is due to its heating effect. They do not include the direct electrical effects on cell membranes, which can occur at radiation levels that are hundreds or even thousands of times lower.

It just should not have happened
Many of these non-thermal effects are catalogued in the BioInitiative Report, which was drawn up by a team of expert scientists in 2007. They examined over two thousand peer-reviewed scientific papers on

the effects of non-ionizing radiation and found that over two thirds of them showed some sort of biological effect that could not be explained by heating (www.bioinitiative.org). Not all were directly concerned with health, but if the ICNIRP guidelines were valid, none of them should ever have occurred. We cannot therefore assume that radiation that falls within the ICNIRP guidelines is necessarily safe.

What causes these non-thermal electrical effects?

Most of the non-thermal effects of electromagnetic radiation can be explained in terms of the leakage of cell membranes following the electromagnetic removal of structurally important calcium ions. It has been known since the work of Suzanne Bawin and her co-workers in 1975 (Bawin et al. 1975. Ann. N.Y. Acad Sci, 247: 74- 81) that otherwise harmless radio waves could remove calcium ions from brain cell membranes when they were amplitude modulated at a low frequency; i.e. when the strength of the radio signal rose and fell in time with the low frequency. These experiments have been repeated many times and also with other tissues such as heart muscle (For a review, see Blackman 2009. Pathophysiology, 16: 205-216).

The general conclusion from these and many similar experiments is that low frequency electromagnetic fields, or radio waves that are amplitude modulated at a low frequency, can remove calcium ions from the membranes of some but not all kinds of living cells. Pulses are more effective than sine waves, possibly because their sharp rise and fall times are more effective at jerking the calcium away from the membrane and also allow more time for it to be replaced by other ions before the field reverses. Pulses carried by microwaves should be particularly effective because the high frequency of the carrier permits faster rise and fall times for the pulses.

The Mechanism of calcium removal

Living tissues can absorb non-ionizing radiation and convert it into alternating electric currents, just like the antenna of a radio set. The only real difference is that, in living tissues, these currents are carried by ions (electrically charged atoms and molecules) rather than electrons. When these currents impinge on cell membranes, which are normally negatively charged, they vibrate like miniature loudspeakers in time with the signal. This loosens some of the positive ions bound to them since they are driven in the opposite direction.

If the signal is strong, all the ions bounce on and off the membrane more or less equally, but if the signal is weak, only the more strongly charged ions, such as calcium (which has a double charge) are pulled off. Ions with only one charge, such as potassium then take their place. Very little energy is needed, since the ions have only to be moved by molecular dimensions and the effect is simply to change the natural chemical equilibrium between the different ions bound to the membrane. However, the effect can be devastating.

Only weak signals do this

Only weak signals can *selectively* remove calcium in this way. Even then, it can only occur in narrow ranges of signal strength called amplitude windows, above and below which there is little or no effect. The exact positions of these windows are indeterminate since they depend on the nature of the membrane, the availability of other ions to replace the calcium and how well the tissue is acting as an antenna.

Cells are constantly moving in and out of their windows.

Living tissues are dynamic systems and their characteristics, including their electrical characteristics, are constantly changing, which means that they will not always be equally efficient as antennas. Also, as we go about our daily business, our exposure to electromagnetic fields and our orientation to them are constantly changing so that individual cells may not stay long enough in their windows to do significant harm.

However, all this changes when the source and orientation of the field is constant, such as when using a mobile phone or sleeping near a base station. Some cells may then be in their windows for long enough to do significant damage. The important thing to note is that any assertion that Wi-Fi and mobile phones must be safer than other forms of electromagnetic radiation just because the signal is weaker is both false and dangerous. Mobile phones and Wi-Fi laptops, by leaving individual cells for prolonged periods in their amplitude widows may do more damage than general electromagnetic pollution. Under some circumstances, a weaker signal may even drive more cells into their amplitude windows and make matters worse.

How calcium loss makes cell membranes leak

The calcium ions lost due to electromagnetic exposure were important. Because they have a double charge they have an especially strong attraction to the negatively charged membrane components on either side and bind them together just as mortar binds together the bricks in a wall. However, the ions with only one charge that replace them do this less well, so the membrane may now develop temporary pores and leak. This leakage can then cause all sorts of harmful effects.

The biological effects of membrane leakage

Many of the so-called “modern illnesses” that have increased, sometimes dramatically, in the last few decades can be linked to cell membrane leakage due to our increasing exposure to non-ionizing electromagnetic radiation.

Electromagnetic hypersensitivity (EHS)

Electromagnetic hypersensitivity is a condition in which people experience physical symptoms such as rashes and/or a wide range of unpleasant sensory disturbances during or shortly after exposure to electromagnetic fields. It can develop in previously healthy people after prolonged exposure and appears to be largely irreversible. It was first noticed in radar technicians, when it was called microwave sickness, but it has increased dramatically in recent years in the general population. About three percent of the population are now affected in this way, and its incidence often appears to be associated with prolonged exposure to microwave based telecommunications.

Virtually all of the symptoms can be explained by electromagnetically-induced cell membrane leakage. Sufferers are characterized by already having unusually leaky cell membranes as measured by skin conductance. This makes them more prone to the consequences of additional electromagnetically-induced leakage. When their skin cells leak, it can result in inflammation and rashes. When their sensory cells leak, it can result in numerous unpleasant sensory disturbances.

We all have many different kinds of sensory cells, but they all work by “deliberately” leaking ions through their membranes when they sense whatever they are programmed to sense. This reduces the natural voltage across their external membranes, which in turn triggers the release of neurotransmitters that stimulate neighboring nerve cells to send signals to the brain. Unscheduled leakage due to electromagnetic exposure can therefore trigger false sensations such as pins and needles, heat, pain and

pressure, depending on which cells are most affected. When the hair cells of the inner ear are affected, it can cause tinnitus, which is a false sensation of sound. When it affects those concerned with balance, it can cause dizziness and trigger symptoms of motion sickness, including nausea. Prolonged exposure to the radiation seems to damage these cells permanently so they become even more inclined to leak and the person becomes sensitized for life.

Brain Hyperactivity

When cells of the brain and nervous system leak, free calcium ions can enter the neurons from outside. In normal circumstances, neurons require a "deliberate" brief inflow of calcium ions to trigger the release of neurotransmitters so that they can send signals to neighboring neurons. Unscheduled steady calcium inflow due to electromagnetic radiation makes them more likely to release neurotransmitters, some of which will send false messages. This in turn can trigger brain hyperactivity leading, amongst other things, to sleep disturbances, loss of concentration (giving rise to ADHD) and stress headaches.

Autism

Electromagnetically-induced brain hyperactivity and confused thought during early childhood may cause autism (which has gone up 60-fold in the last thirty years). Basic social skills are learnt during the first 18-months of life, after which they become hard-wired into the child's psyche by pruning under-used synapses. This enables them to become automatic and require very little thought. However, this mass cull of under-used synapses is a normal stage in development that occurs only once at around 18 months. If the initial learning process has been disrupted by brain hyperactivity, many social skills may remain poorly learnt by the time the synapses are pruned, and the child may become irreversibly autistic. Babies exposed to the radiation from cordless baby monitors may be particularly at risk but this has not been tested.

Dementia

Dementia in the elderly also seems to be on the increase, and some of it can be attributed to electromagnetic exposure. Salford and co-workers (Salford et al. 2003. Environmental Health Perspectives 111: 881-883) showed that extremely weak electromagnetic radiation such as that from mobile phones could disrupt the blood brain barrier and allow unwanted materials, such as albumin from the blood stream to enter and kill neurons. Although the effect may not be immediately noticeable, prolonged exposure is likely to lead to early dementia.

Allergies

All of our body surfaces, both inside and out, are normally protected from unwanted materials entering by barriers similar to the blood-brain barrier, where the gaps between the cells are sealed, forming what are known as tight junctions. There is strong evidence that these too leak in response to weak electromagnetic radiation, which would allow the more rapid entry of allergens, foreign chemicals and other unwanted materials. This may account for the massive increases in asthma, allergies and multiple chemical sensitivities that have accompanied our increasing exposures to electromagnetic radiation in recent years.

Autoimmune diseases

These include type-1 diabetes, multiple sclerosis and celiac disease, all of which are on the increase. This has been attributed to an increased leakiness of the gut barrier (also known as leaky gut syndrome) and may be exacerbated by electromagnetic exposure. It allows particles of partially digested food to enter the bloodstream. From there, they may be engulfed by body cells by endocytosis, followed by an

attempt to digest them internally. However, some materials, e.g. gluten, are difficult to digest and may be mistaken for a virus. The cell responds by displaying it on its surface, which identifies it to the white blood cells of the immune system as a cell that must be killed to prevent the spread of the "infection". This triggers inflammation, which is both painful and attracts more white blood cells to the area, which may make matters worse and results in the death of perfectly healthy cells. Celiac disease is an autoimmune response, triggered by gluten, which causes inflammation of the gut, but autoimmune diseases in other parts of the body may have a similar aetiology.

Effects on internal membranes and DNA

There are at least two mechanisms by which the leakage of the cell's internal membranes can damage DNA. Living cells are divided into various internal compartments by membranes that are all variations of the same basic structure as the outer membrane. From our standpoint, the two most important compartments are the lysosomes and the mitochondria.

The lysosomes are membrane-bound structures full of digestive enzymes that digest cellular waste ready for recycling. Membrane leakage here releases these enzymes, which can digest and damage the rest of the cell, including its DNA.

The mitochondria are the cell's power stations. They carry out the controlled oxidation of materials derived from our food to generate ATP, which is the main energy currency of the cell. This oxidation actually goes on in groups of enzymes embedded in their membranes and involves highly reactive chemicals called free radicals. Damage to these membranes is likely to release of some of these free radicals that can then react with and destroy other cellular components, including DNA. It's like blowing up a furnace scattering burning embers everywhere.

There is even some similarity to blowing up a nuclear power station since, although no radioactivity is involved, the free radicals that are normally locked safely away in the mitochondrial membranes, have very similar activities to those that do most of the damage when a cell is irradiated with gamma rays. Indeed, many concerned scientists have noted the similarity between the biological effects of non-ionizing radiation and gamma rays. Non-ionizing radiation should therefore be treated with as much caution as ionizing radiation until much more is known about its biological effects.

Brain Cancer

DNA damage has been found in many experiments in many laboratories when cultured cells have been exposed to mobile phone radiation, even for less than a day (see www.bioinitiative.org). It can therefore account for the brain and other head cancers that we are now beginning to see in people who have been heavy users of mobile phones for ten years or more; with children being at greatest risk (Hardell et al. 2009 Pathophysiology 16: 113-122).

Thyroid cancer

There has also been an unexplained increase in thyroid cancer in recent years (the thyroid gland is in the neck; just inches from where you hold your mobile phone) and may have a similar aetiology to brain cancer.

Mobile phones may make you fat

Another consequence of DNA damage is a partial loss of function in the exposed organ. For example, Rajkovic and co-workers (Rajkovic et al. 2003 Tissue & Cell 35: 223–231) showed that exposing rats to

power line frequencies for over three months caused a seemingly permanent loss of thyroid function. If this were to occur in humans as a result of the radiation from wireless telecommunications, we would expect to see widespread symptoms of hypothyroidism, which include fatigue, loss of muscle tone and obesity. It may be no coincidence that about thirty percent of our population is now either overweight or clinically obese (with all the extra risks to health that this implies) and the number of teenagers on anti-obesity drugs has gone up 15-fold in the ten years since the use of mobile phones, DECT cordless phones and Wi-Fi became almost universal.

Effects on fertility

There have been several studies showing that mobile phone use reduces male fertility. One of the more recent, by Agarwal and co-workers (Agarwal et al. 2008 Fertil Steril 89: 124-8) showed that using a mobile phone for more than four hours a day caused a reduction in sperm numbers, motility and viability, each of around 25 percent. The prolonged use of a Wi-Fi laptop computer on or near the lap could have even more serious consequences for male fertility. Effects on female fertility have not yet been studied but, since all the eggs that a woman will ever have were already in her ovaries before she was born, the cumulative effect could be considerable. All of these effects can be attributed to electromagnetic DNA damage, which could also lead to miscarriages, deformities in the offspring and genetic mutations that may not appear for several generations. Anyone who considers Wi-Fi to be safe should think again.

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http://www.radiationresearch.org/pdfs/20090926_hpa_Wi-Fi_ag_comments.pdf

Dispelling the Wireless Myths

With all of the recent coverage of Wi-Fi networks and mobile phone base stations, it seems appropriate to address some of the common microwave radiation exposure myths that get frequently promulgated by the pseudo-scientific, pseudo-intellectual technical community online.

Myth 1: We've been exposed to this radiation for years, it must be safe

From the Sun

Yes, we had heard quite a few people saying that standard cosmic background radiation has enough microwaves in it that we should already be being affected even before the appearance of TV and radio, let alone mobile phones. The background microwave radiation (by which we refer to frequencies ranging from 300 MHz to 30 GHz) from the Sun was almost non-existent, millionths of what can be found in your local wireless cafe. So even if the signals themselves were the same, this claim is nonsense.

Background on Radiation Frequencies

It is generally accepted now that X-rays can cause health problems via known mechanisms (e.g. DNA strand breaks). It is also generally accepted that visible light does not cause much harm (with the possible exception of eye-damage if the intensity is too great) during the daytime (caveat here as night-time visible light may cause health problems such as breast cancer indirectly by melatonin suppression). As any physicist could tell you, whilst both naturally occurring forms of radiation, they consist of very different wavelengths and are not comparable.

From Radio and TV

FM Radio tranmissions are at about 100 MHz, considerably lower than the 900 MHz and 1800 MHz of GSM mobile phone communications. Moreover, and we believe this is of critical importance, radio transmissions are continuous wave transmissions, and do not rely on pulsed signals to transmit data. Likewise, whilst the transmission frequency of TV is much closer (approximately 450 to 850 MHz), this is again close to continuous wave, and does not have anything like the amplitude modulation that mobile phone carriers do.

This is crucial, not because it guarantees that there must therefore be a risk, but because it highlights that this exposure is new. We are now being surrounded and bombarded by radiation that is unlike anything we have been exposed to previously. It may be safe, it may not be, but we cannot use the argument that it has been around for years as this is not the case.

Myth 2: People only got affected when the scare stories started, it must be psychosomatic

Again, this is a quickly dispelled myth (often also referred to as a 'nocebo' effect -- basically a negative 'placebo' effect). A quick look at some of the science:

Cell death induced by GSM 900-MHz and DCS 1800-MHz mobile telephony radiation
Panagopoulos DJ et al, January 2007 [View on Pubmed]

This study from the University of Athens in Greece found that DNA fragmentation of egg chamber cells could be created in fruit flies when exposed to a simulated phone call from a real digital mobile phone. Yes, this is not damaging human tissue, but it is clearly not a psychological response.

Effects of electromagnetic radiation from a cellular phone on human sperm motility: an in vitro study
Erogol O et al, October 2006 [View on Pubmed]

This study from Turkey found examined the sperm motility (a measure of fertility) in 27 male human subjects. They found that after exposure from a standard GSM 900-MHz mobile phone sperm motility was measurably decreased, and that this decrease was statistically signifcant. Again, not a psychological response.

Gene expression changes in human cells after exposure to mobile phone microwaves
Remondini D et al, September 2006 [View on Pubmed]

This *in vitro* study from the University of Bologna in Italy found that some (but not all) of the tested cell lines would react to 900 and 1800 MHz microwave radiation. This is again evidence that a non-thermal reaction can be found that is not psychological, and again can be replicated in lab conditions.

Possible Effects of Electromagnetic Fields from Phone Masts on a Population of White Stork (Ciconia ciconia)
Balmori A, October 2005 [View full paper on our site]

This time a study on animal populations in Spain, Balmori looked at the nesting and behavioural patterns of white storks located around a mobile phone base station near Valladolid. Some very startling results, such as the storks failing to start or half building their nests. It was also found that the number of storks without young rose from a consistent average of 5-10% before the mast was built up to 40% after the mast was built. Again this is not looking at humans, but it is also therefore not feasible to put this down to some form of psychosomatic phenomena.

Myth 3: Being on a phone for 20 minutes is equivalent to 1 year in a Wi-Fi classroom

This statement, very unhelpfully publicized by Mike Clark, senior spokesperson for the Health Protection Agency, is both factually incorrect and highly misleading.

Whist Mike Clark is right that a mobile phone, working on full power and with you talking continuously (not listening) can technically expose you up to about 50% of the SAR limits. In normal use, with a good number of signal strength bars showing on the display (say 75% signal level), the phone will be working at somewhere between one-thousandth and one-twentieth of this level. Let's average this at about one fiftieth as a reasonable level for the phone to be operating at most of the time. Then, if you are talking 50% of the time, this would reduce the transmitted pulses (using DTX) by another factor of 2. So, a typical exposure would not be 50% of the SAR limit but more like 0.5% of the SAR limit which we should assume to be 0.5% of the the ICNIRP limit (for a typical call).

11/10/2007 - This has been updated to more accurately reflect expected real life power outputs from Wireless access points in use.

Now we come to a slightly different exposure regime in the classroom in that you are not holding the wLAN card to your head. 2.4 GHz wLANs (most common in the UK) operate at 0.03 watts output power (5-6 GHz ones can use up to 20 times this). So we have one wLAN node in the classroom (0.03 W) and, say, 20 laptops all at 0.03 W. However, they are only transmitting much power when actually transferring files. So, let's say that we have the equivalent of one laptop operating absolutely continuously (actually the combined output of 20 may well be more that this), and that we are on

average 2 meters from the antennas. This seems reasonable based on the fact that there are 20 in the room. So E = (sq.root (30*0.03*2))/2 = 0.67 V/m equivalent continuous. Now the ICNIRP guidance at 2.4 GHz is 61.5 V/m. So the signal strength is about 1/100th of what is allowed. Power is proportional to signal strength squared so that would be around 1/10000th of the ICNIRP power level.

So, we have a mobile phone call next to head typically 0.5% (1/200th) of the ICNIRP guidance. We also have being in a 20 PC wLAN classroom being something in the order of 0.01% (or 1/10000th) of ICNIRP guidance, about a 50-fold difference.

Therefore 20 minutes on a mobile phone running at typical power levels would be equivalent to about 16 hours in a classroom with 20 wLAN PCs, approximately eight standard school days.

There are other differences. In the phone call situation, almost all the energy goes into the user's head and hand. In a classroom situation the whole body absorbs this lower level of power, so the "total body burden" if we were to compare it with ionizing radiation (for example), would actually be very similar.

We have no idea how Mike Clark can feel justified in claiming this completely unsubstantiated and unsupportable statistic.

Addendum:
The above calculations are based on absorbed power levels, which is based on the idea that the only thing that microwaves do is heat you. As we are looking at non-thermal effects we believe that signal strength is likely to be a more appropriate metric (measured in volts per metre). This has the advantage of not being averaged over time, and we can therefore tell the difference between exposure from a continuous wave signal and one where the signal consists of a number of short pulses with gaps.

Myth 4: The WHO factsheet says there is no cause for concern, and they should know

Whilst it would be great if this was true, it also appears that they have become quite the bureaucracy when it comes to actually keeping on top of the science. The wonderful factsheet that keeps getting quoted as evidence that there is no problem can be found here, and was last updated in June 2000, over 6 and a half years ago! They have not taken into account any of Hardell's work showing an increase in brain cancer from mobile phone usage, the INTERPHONE studies, nor did they assess any of the papers shown in the rebuttal of myth 2 (which, incidentally, is just the tip of the iceberg anyway). This factsheet is so hopelessly out of date with regards to the current state of science on this issue that it should now be simply ignored.

Important Update - 07/06/2007: Actually, this section is incorrect, the latest WHO factsheet on electromagnetic fields and health is Factsheet 304, from May 2006. So whilst it would still have ignored all 4 references in Myth 2, it is much more relevant. Sadly, some points made in the document are factually incorrect, such as "To date, the only health effect from RF fields identified in scientific reviews has been related to an increase in body temperature (> 1 °C) from exposure at very high field intensity found only in certain industrial facilities, such as RF heaters". The factsheet also states "Over the past 15 years, studies examining a potential relationship between RF transmitters and cancer have been published. These studies have not provided evidence that RF exposure from the transmitters increases the risk of cancer." So whilst it is a more recent report, I can only assume that this review also didn't look at the Hardell work that found a clear and statistically significant increase in some forms of brain cancer from extended mobile and cordless phone use.

The problem is that the sentences themselves are "enhanced" by the usage of highly subjective terminology. For example, the conclusions state "Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects." Everything in this sentence hinges around the word "convincing", without which the statement would be factually incorrect. However, convincing is both entirely subjective and also not justified in either the document itself nor the linked documents. It would be interesting to understand exactly what constituted "convincing", and in the meantime it would be better to have a less ambiguous description of what the correct science actually says.

http://www.powerwatch.org.uk/news/20070424_Wi-Fi_myths.asp

The Invisible Threat: Radiofrequency Radiation Risk

The wireless industry has experienced rapid growth since the first cell phone call was made in 1973. Today, there are more than 285 million wireless subscribers on commercial networks in the United States alone. To supply this vast consumer base (more than 90% of Americans) with coverage, the industry has dramatically expanded its networks. In 1996, there were fewer than 23,000 cell sites throughout the United States. Today, there are more than 247,000 commercial cell sites in the country, according to industry advocacy group CTIA. If you add in government-run sites, that number jumps to 600,000. In the near future, there will be more than one million. And each of these antennas creates a radiofrequency radiation hazard zone.

Decades of scientific research dating back to 1960 has determined that excessive exposure to radiofrequency radiation is hazardous to human health. In response, the Institute of Electrical and Electronics Engineers (IEEE), the world's largest professional association for the advancement of technology, developed the first standard for human exposure limits to radiofrequency radiation in 1966.

There have been revisions over the years as the issue has become better understood, and these standards have been widely adopted throughout the world by various groups. The American National Standard Institute, for one, adopted the IEEE limits as a national standard in 1992. The FCC incorporated the limits into its regulations in 1996.

All told, the present, multi-agency exposure guidelines have a lineage that dates back nearly half a century and is based on long-standing, uncontroverted science clearly demonstrating that radiofrequency radiation exposure causes "behavioral disruption," including reduced brain function and memory loss in laboratory subjects. In other words, science proves the causal link between radiofrequency radiation exposure and behavioral, cognitive and psychological injuries, such as depression, memory loss, mood disorders, sleep disorders and impaired cognitive function.

The Alaska Supreme Court has also recognized the link between radiofrequency exposures and psychological injuries. In AT&T Alascom v. Orchitt, satellite communications provider AT&T Alascom was forced to pay temporary total disability and medical benefits to John Orchitt, a company employee. Orchitt originally filed for workers compensation benefits claiming that he had suffered head, brain and upper-body injuries as a result of overexposure to radiofrequency radiation. AT&T tried to appeal the verdict in both state superior and supreme courts to no avail.

The lesson here is that while the disability benefits themselves may not have been huge in monetary terms, the case resulted in a string of expert witnesses on both sides, eight years of litigation, expensive legal fees for AT&T and, still, the company lost. Even if the scientifically proven risks of radiofrequency radiation do not scare you, this precedent alone should alarm any company that believes this liability is not worth worrying about.

The financial risk posed by the potential litigation that may be filed on behalf of workers may be significant for many employers, FCC licensees (commercial or governmental), property owners/managers, utility companies, local governments, school districts and universities. Of course, their insurance companies will also be subject to that same potential liability. And given that the number

of antenna sites in the United States is expected to double within the near future-not to mention the use of new, stealth and collocated antennas-the financial fallout could rise exponentially.

For potential plaintiffs, proving overexposure to radiofrequency radiation is not difficult. Counsel can easily show that a worker performed a specific task at an antenna site, noting the proximity to radiofrequency radiation transmitting antenna systems (which, these days, are located everywhere) and the length of exposure time. A subpoena would likely prove that, under current and historical business practices, most FCC licensees do not power-down radiofrequency transmitting antennas to protect third party workers.

Thus, proof of a violation of radiofrequency radiation above human exposure limits will be straightforward. And sympathetic juries could render substantial judgments. It is not out of the question to think that the potential litigation could be comparable to the fallout created by asbestos or mold. And as any company that has been subject to those claims can attest, such long-tail liabilities are not just expensive-they are huge internal resource drains.

Improving Safety

In order to prevent such a legal nightmare, radiofrequency radiation safety must be improved and implemented immediately. Current strategies and methodologies to protect workers have been outstripped and rendered obsolete by the rapid proliferation of wireless networks.

In the past, the limited number of systems were isolated and could be fenced-off with access only granted to radiofrequency-trained technicians. But today, wireless antennas are everywhere: on rooftops, the sides of buildings, utility poles, light standards and hidden entirely within the structures of buildings.

Workers who are required to perform their jobs in close proximity to radiofrequency radiation transmitters are no longer just trained industry technicians protected by the latest gear and equipment. Rather, they are now roofers, electricians, carpenters, maintenance personnel, HVAC technicians, painters, first-responders and many others. And they are routinely required to work in exposure zones without the benefit of safety training-and, often, without any knowledge that over-exposure to wireless systems can be dangerous in the first place.

Ultimately, these unsuspecting workers are regularly exposed to excessive levels of radiofrequency radiation because there is no comprehensive radiation safety system currently in operation. And given the health hazards and potential liabilities involved, the time for complacency and neglect to the safety of our nation’s workers has passed. A viable radiofrequency safety program must be implemented, and it must be characterized by independence, transparency and validation. It also must be implemented now.

First and foremost, education is crucial. Everyone at risk should be taught the exposure regulations and hazards associated with radiofrequency emissions. Workers must be given site-specific safety plans that combine with an updated database of antenna locations to establish a standardized national radiofrequency safety protocol that includes the participation of all required stakeholders (i.e., FCC

licensees, property owners hosting antenna sites, employers, local governments and the workers themselves).

A national, accessible registry of wireless antenna systems that identifies location and exposure zones throughout North America will end the wholesale addition of new claimants and significantly reduce the financial liability of all stakeholders. The registry will be similar to the "Call 811 before you dig" underground utility locator service and constitute an electronic repository of documentary evidence of use and compliance with radiofrequency safety.

For this to occur, the insurance industry must also demand the deployment of a meaningful loss-control tool to continue to provide affordable coverage to its customers. The industry should not be lulled into a false sense of security by the momentary dearth of claims and lawsuits brought on behalf of workers seeking compensation.

The risk is here, it is imminent and unless a loss-control tool is implemented to protect the insurance industry and its insured customers, an inevitable tidal wave of litigation with significant financial consequences is assured.

http://www.rmmagazine.com/2010/08/01/the-invisible-threat-radiofrequency-radiation-risk/

Radiation from Cell Phones and Wi-Fi Are Making People Sick -- Are You at Risk?

There are over 5 billion operating cell phones on the planet. These phones exchange signals with millions of cell phone towers. In your home, your favorite coffee shop, your local library and certainly in your office, you have WI-FI.

You probably also have a sprinkling of other wireless technologies, like a cordless phone, a wireless baby monitor or alarm system, or maybe even a USB-powered device that gives your cell phone Web access, which has been referred to as a "cell-phone tower for your pocket."

Even if you have opted out of such conveniences, there's a good chance your neighborhood has not. This means that, essentially, your environment is saturated with wireless technologies and the frequencies they emit – and you're being impacted whether you realize it or not.

The simple answer to this question is, no one knows. How could they? The technologies that have become so intertwined with what it means to live in the 21st century – cell phones, laptops, iPads, and so on – have never-before existed.

And as a species, we have embraced them fully, without understanding what types of risks they may ultimately present. As written in AlterNet:

"We now live in a wireless-saturated normality that has never existed in the history of the human race. It is unprecedented because of the complexity of the modulated frequencies that carry the increasingly complex information we transmit on our cell phones, smart phones and wi-fi systems.

These EMFs [electromagnetic fields] are largely untested in their effects on human beings. Swedish neuroscientist Olle Johansson, who teaches at the world-renowned Karolinska Institute in Stockholm, … [states] the mass saturation in electromagnetic fields raises terrible questions.

Humanity, he says, has embarked on the equivalent of "the largest full-scale experiment ever. What happens when, 24 hours around the clock, we allow ourselves and our children to be whole-body-irradiated by new, man-made electromagnetic fields for the entirety of our lives?"

There is reason for concern, not only because an outpouring of research is painting a very different picture about cell phone safety than the telecommunications industry would have you believe, but also because of a growing population of electrically sensitive individuals, the EMF canaries in the coal mine.

It is estimated that 3-8 percent of populations in developed countries experience serious electrohypersensitivity symptoms, while 35 percent experience mild symptoms, according to Dr. Thomas Rau, medical director of the world-renowned Paracelsus Clinic in Switzerland. Dr. Rau also believes that 'electromagnetic loads' lead to cancer, concentration problems, ADD, tinnitus, migraines, insomnia, arrhythmia, Parkinson's and even back pain.
You can listen to an audio interview with Dr. Rau on www.electromagnetichealth.org. For people with Electromagnetic Hypersensitivity Syndrome (EHS), just walking into a coffee shop that is WI-FI equipped can be debilitating, triggering a wide array of symptoms including headache, fatigue, nausea, burning and itchy skin, and muscle aches. Some students have to drop out of school or are unable to continue on

to graduate programs once they become electrically sensitive, irrespective of their intelligence and capabilities.
Even just briefly standing in line at the post office, or traveling on public transportation, can be a debilitating experience for some people, sometimes taking hours to restore balance. In this AlterNet article, you can read several examples from people who believe exposure to electromagnetic radio frequencies made them sick, including:

- The Rall family, whose farm animals became sick and developed tumors, and whose children suffered hyperactivity, skin rashes, and neurological problems, after a cell phone tower was put up 800 feet from their home.
- Michele Hertz, who experienced severe memory loss, inability to concentrate and other significant debilitating symptoms after a wireless "smart" meter was installed on her house.

The conventional medical establishment has yet to acknowledge electrohypersensitivity as a "real" health issue, but the number of people experiencing severe symptoms that clear up when exposure to EMFs is eliminated, makes it impossible to ignore.
Further, with the work of Magda Havas, PhD, of the Environmental & Resources Studies Department at Trent University, Canada and others, acceptance is slowly growing and the real health effects of EMF are becoming harder to deny.
For instance, research from Dr. Havas revealed that a cordless phone base station placed about two feet from your head and plugged in for three minutes at a time can significantly disrupt your heart rhythm, leading to increases in heart rate, arrhythmias and other disturbances in heart rate variability.

This is among the most solid proof that the effects of EMF radiation are real, as are the symptoms that some people readily experience when they're around such microwave-emitting devices. The biological effects on the heart in the Havas study were found at .3% of the FCC exposure limits.
Researchers have, in fact, found that there are a number of factors that influence the degree to which you may be affected by EMFs. For example, according to research by Dr. Dietrich Klinghardt, your physical body, such as your body weight, body-mass index, bone density, and water and electrolyte levels can alter the conductivity and biological reactivity to EMFs. Children are also particularly vulnerable.

While some of the health effects of the wireless revolution are immediately apparent to sensitive populations, most people seemingly feel fine when using the technology. However, this should not be taken as guarantee of safety, as some health conditions take years, or even decades, of exposure to develop.

The perfect example? Cancer.

On May 21, 2011, the International Agency for Research on Cancer (IARC), a committee of 27 scientists from 14 different countries working on behalf of the World Health Organization (WHO), also concluded that exposure to cell phone radiation is a "possible carcinogen" and classified it into the 2B category. This is the same category as the pesticide DDT, lead, gasoline engine exhaust, burning coal and dry cleaning chemicals, just to name a few.

The group did not perform any new research; rather the decision is based on a review of the previously published evidence, including the Interphone study results published so far (about 50% have still not been released). This is the same evidence that the National Cancer Institute (NCI) and the American Cancer Society (ACS), among others, have previously waved aside, calling it "reassuring," and claiming it showed "no evidence" of harm. The IARC decision came only days after the Council of Europe, elders from 47 European countries, called for a dramatic reduction in EMF exposure to humans from call phones and wireless technologies.

Some nations have already adopted the precautionary principle, and have previously issued precautionary advice to mobile phone users. Now that cell phone radiation has been classified as a "possible carcinogen," these messages can be strengthened in a meaningful way to reach more people, across the world.

Dr. Martin Blank, PhD, of Columbia University and one of the most experienced researchers of the cellular and molecular effects of electromagnetic fields in the U.S., gave an informative speech at the November 18, 2010 Commonwealth Club of California program, "The Health Effects of Electromagnetic Fields," co-sponsored by ElectromagneticHealth.org.

Dr. Blank spoke with deep experience and commanding authority on the impact of electromagnetic fields on cells and DNA, and explained why your DNA, with its 'coil of coils' structure, is especially vulnerable to electromagnetic fields of all kinds. As described in the International Journal of Radiation Biology, April 2011, DNA possesses the two structural characteristics of fractal antennas, electronic conduction and self-symmetry.

These properties contribute to greater reactivity of DNA to electromagnetic fields than other tissues, making the long-term consequences of repeated microwave exposures to our genetic material of great concern.

Dr. Blank is adamant when he says that there IS evidence of harm, and that the harm can be significant. He also points out that the science showing harmful effects has been peer-reviewed, published, and that the results have been replicated, evaluated and "judged by scientists capable of judging it."

Even barring all the scientific evidence, it simply makes sense that cell phones and wireless technology can impact the human body once you understand that your body is bioelectric. Your body contains electrons which keep an electrical current flowing, and inside every cell are mitochondria, the 'power plants' of the cell that respond to the body's natural electromagnetic fields.

As Dr. Maret explains in his interview with ElectromagneticHealth.org, your body is a complex communication system where cells, tissues, organs, and organisms "talk" -- it's a veritable "electronic symphony in your body." This communication includes finely tuned bio-electrical transmitters and receivers, which are tuned like tuning into a radio station.

And when you expose a radio antenna to a significant amount of external noise, you get static, and that is what is happening to your body in today's EMF-saturated environment.

We're still in the infancy of EMF science as it relates to understanding the mechanism of the human health effects, but there is enough solid evidence to show that there are very real risks apparent. It is time to exercise the precautionary principle, but keep in mind that completely eliminating exposure is close to impossible. Even if you don't use a cell phone and your home is wireless-free, you can be exposed to microwave radiation from your neighbor's wireless devices or while visiting "hot spots" or traveling near cell phone towers. That said, there's still plenty you can do to minimize your exposure and help safeguard your children's health:

- Children Should Never Use Cell Phones: Barring a life-threatening emergency, children should not use a cell phone, or a wireless device of any type. Children are far more vulnerable to cell phone radiation than adults, because of their thinner skull bones, and still developing immune and neurological systems.
- Reduce Your Cell Phone Use: Turn your cell phone off more often. Reserve it for emergencies or important matters. As long as your cell phone is on, it emits radiation intermittently, even when you are not actually making a call.
- Leave an outgoing message on your phone stating your cell phone policy so others know not to call you on it except in emergencies.
- Use a Land Line at Home and at Work: Although more and more people are switching to using cell phones as their exclusive phone contact, it is a dangerous trend and you can choose to opt out of the madness.
- Reduce or Eliminate Your Use of Other Wireless Devices: You would be wise to cut down your use of these devices. Just as with cell phones, it is important to ask yourself whether or not you really need to use them every single time.
- If you must use a portable home phone, use the older kind that operates at 900 MHz. They are no safer during calls, but at least some of them do not broadcast constantly even when no call is being made. Note the only way to truly be sure if there is an exposure from your cordless phone is to measure with an electrosmog meter, and it must be one that goes up to the frequency of your portable phone (so old meters won't help much). As many portable phones are 5.8 Gigahertz, we recommend you look for RF meters that go up to 8 Gigahertz, the highest range now available in a meter suitable for consumers.
- Alternatively you can be very careful with the base station placement as that causes the bulk of the problem since it transmits signals 24/7, even when you aren't talking. So if you can keep the base station at least three rooms away from where you spend most of your time, and especially your bedroom, it may not be as damaging to your health.
- Ideally it would be helpful to turn off or disconnect your base station every night before you go to bed. Levels of microwave radiation from portable phones can be extraordinarily high.
- Your portable phone is a problem if the technology is labeled DECT, or digitally enhanced cordless technology.
- Limit Your Cell Phone Use to Where Reception is Good: The weaker the reception, the more power your phone must use to transmit, and the more power it uses, the more radiation it emits, and the deeper the dangerous radio waves penetrate into your body. Ideally, you should only use your phone with full bars and good reception.
- Also seek to avoid carrying your phone on your body as that merely maximizes any potential exposure. Ideally put it in your purse or carrying bag. Placing a cell phone in a shirt pocket over

the heart is asking for trouble, as is placing it in a man's pocket if he seeks to preserve his fertility.

- Don't Assume One Cell Phone is Safer than Another. There's no such thing as a "safe" cell phone, and do not rely on the SAR value to evaluate the safety of your phone. Always seek CDMA carriers over GSM as they have far lower radiation in their signaling technology. And remember, eliminating cell phone use, or greatly lowering cell phone use from phones of all kinds, is where true prevention begins.
- Keep Your Cell Phone Away From Your Body When it is On: The most dangerous place to be, in terms of radiation exposure, is within about six inches of the emitting antenna. You do not want any part of your body within that area.
- Respect Others Who are More Sensitive: Some people who have become sensitive can feel the effects of others' cell phones in the same room, even when it is on but not being used. If you are in a meeting, on public transportation, in a courtroom or other public places, such as a doctor's office, keep your cell phone turned off out of consideration for the 'second hand radiation' effects. Children are also more vulnerable, so please avoid using your cell phone near children.
- Use Safer Headset Technology: Wired headsets will certainly allow you to keep the cell phone farther away from your body. However, if a wired headset is not well-shielded the wire itself acts as an antenna attracting ambient information carrying radio waves and transmitting radiation directly to your brain. Make sure that the wire used to transmit the signal to your ear is shielded.

The best kind of headset to use is a combination shielded wire and air-tube headset. These operate like a stethoscope, transmitting the information to your head as an actual sound wave; although there are wires that still must be shielded, there is no wire that goes all the way up to your head.

Are You Electrically Sensitive?

To further avoid EMF exposure, or for those who are especially sensitive, it's especially to stay protected during the night when your body is trying to repair and rebuild:

- Turn off all the fuses at night that supply your bedroom. You can install a 'demand switch' at your bedside to make this very convenient.
- Shield your bed with a special metalized fabric canopy to protect yourself from harmful frequencies that can disrupt cellular communication.
- If you are constructing a new home or renovating one and the walls are being rebuilt you can install radiant barrier, which is a tough type of aluminum foil that will also very effectively screen out the EMF. This is what I did for my own bedroom.
- At minimum, move your bed so that your head is at least 3-6 feet from all electrical outlets. If you are constructing the walls you can put the wires inside pipes, which will virtually eliminate the fields that are generated in the room when the current runs through the wire.
- Turn off and unplug everything electrical in your sleeping area, including your computer, WI-FI, cell and portable phones.
- Sleep on a non-metal bed and mattress.

- Be aware that cell phones and WI-FI are not the only EMF sources you need to be cautious of. Essentially, most all electronics will generate EMFs, including the wiring in your home, electric alarm clocks, electric blankets, computers and lamps, just to mention a few.
- For best results, avoid using electric blankets and electric heating pads, and unplug all electrical appliances when not in use. Even better, at night, turn off the fuses directly.
- Protect yourself from cordless phones. If you want to avoid the radiation you should switch back to a wired landline and ditch your cordless phone entirely.
- If you must use a conventional cordless phone, be sure to keep the base station at least three rooms away from where everyone sleeps and where you spend the most time during the day. Or simply keep it off except in the limited circumstances when you feel you need to use it.
- The base station of a DECT phone always transmits at full power, so this is not a device you want sitting on your nightstand next to your bed, on your kitchen counter or even on at all if it is not necessary.

http://articles.mercola.com/sites/articles/archive/2011/12/20/radiation-from-cell-phones-and-Wi-Fi-are-making-people-sick--are-you-at-risk.aspx

Radiation From Cell Phones and Wi-Fi Are Making People Sick — Are We All at Risk?

We are now exposed to electromagnetic radio frequencies 24 hours a day. Welcome to the largest human experiment ever.

December 2, 2011

Consider this story: It's January 1990, during the pioneer build-out of mobile phone service. A cell tower goes up 800 feet from the house of Alison Rall, in Mansfield, Ohio, where she and her husband run a 160-acre dairy farm. The first thing the Rall family notices is that the ducks on their land lay eggs that don't hatch. That spring there are no ducklings.

By the fall of 1990, the cattle herd that pastures near the tower is sick. The animals are thin, their ribs are showing, their coats growing rough, and their behavior is weird -- they're agitated, nervous. Soon the cows are miscarrying, and so are the goats. Many of the animals that gestate are born deformed. There are goats with webbed necks, goats with front legs shorter than their rear legs. One calf in the womb has a tumor the size of a basketball, another carries a tumor three feet in diameter, big enough that he won't pass through the birth canal. Rall and the local veterinarian finally cut open the mother to get the creature out alive. The vet records the nightmare in her log: "I've never seen anything like this in my entire practice... All of [this] I feel was a result of the cellular tower."

Within six months, Rall's three young children begin suffering bizarre skin rashes, raised red "hot spots." The kids are hit with waves of hyperactivity; the youngest child sometimes spins in circles, whirling madly. The girls lose hair. Rall is soon pregnant with a fourth child, but she can't gain weight. Her son is born with birth defects -- brittle bones, neurological problems -- that fit no specific syndrome. Her other children, conceived prior to the arrival of the tower, had been born healthy.

Desperate to understand what is happening to her family and her farm, Rall contacts the Environmental Protection Agency. She ends up talking to an EPA scientist named Carl Blackman, an expert on the biological effects of radiation from electromagnetic fields (EMFs) -- the kind of radiofrequency EMFs (RF-EMFs) by which all wireless technology operates, including not just cell towers and cell phones but Wi-Fi hubs and Wi-Fi-capable computers, "smart" utility meters, and even cordless home phones. "With my government cap on, I'm supposed to tell you you're perfectly safe," Blackman tells her. "With my civilian cap on, I have to tell you to consider leaving."

Blackman's warning casts a pall on the family. When Rall contacts the cell phone company operating the tower, they tell her there is "no possibility whatsoever" that the tower is the source of her ills. "You're probably in the safest place in America," the company representative tells her.

The Ralls abandoned the farm on Christmas Day of 1992 and never re-sold it, unwilling to subject others to the horrors they had experienced. Within weeks of fleeing to land they owned in Michigan, the children recovered their health, and so did the herd.

Not a single one of the half-dozen scientists I spoke to could explain what had happened on the Rall farm. Why the sickened animals? Why the skin rashes, the hyperactivity? Why the birth defects? If the radiofrequency radiation from the cell tower was the cause, then what was the mechanism? And why today, with millions of cell towers dotting the planet and billions of cell phones placed next to billions of heads every day, aren't we all getting sick?

In fact, the great majority of us appear to be just fine. We all live in range of cell towers now, and we are all wireless operators. More than wireless operators, we're nuts about the technology. Who doesn't keep at their side at all times the electro-plastic appendage for the suckling of information?

The mobile phone as a technology was developed in the 1970s, commercialized in the mid-80s, miniaturized in the '90s. When the first mobile phone companies launched in the United Kingdom in 1985, the expectation was that perhaps 10,000 phones would sell. Worldwide shipments of mobile phones topped the one billion mark in 2006. As of October 2010 there were 5.2 billion cell phones operating on the planet. "Penetration," in the marketing-speak of the companies, often tops 100 percent in many countries, meaning there is more than one connection per person. The mobile phone in its various manifestations -- the iPhone, the Android, the Blackberry -- has been called the "most prolific consumer device" ever proffered.

I don't have an Internet connection at my home in Brooklyn, and, like a dinosaur, I still keep a landline. But if I stand on my roof, I see a hundred feet away, attached to the bricks of the neighboring parking garage, a panel of cell phone antennae -- pointed straight at me. They produce wonderful reception on my cell phone. My neighbors in the apartment below have a wireless fidelity connection -- better known as Wi-Fi -- which I tap into when I have to argue with magazine editors. This is very convenient. I use it. I abuse it.

Yet even though I have, in a fashion, opted out, here I am, on a rooftop in Brooklyn, standing bathed in the radiation from the cell phone panels on the parking garage next door. I am also bathed in the radiation from the neighbors' Wi-Fi downstairs. The waves are everywhere, from public libraries to Amtrak trains to restaurants and bars and even public squares like Zuccotti Park in downtown Manhattan, where the Wall Street occupiers relentlessly tweet.

We now live in a wireless-saturated normality that has never existed in the history of the human race.

It is unprecedented because of the complexity of the modulated frequencies that carry the increasingly complex information we transmit on our cell phones, smart phones and Wi-Fi systems. These EMFs are largely untested in their effects on human beings. Swedish neuroscientist Olle Johansson, who teaches at the world-renowned Karolinska Institute in Stockholm, tells me the mass saturation in electromagnetic fields raises terrible questions. Humanity, he says, has embarked on the equivalent of "the largest full-scale experiment ever. What happens when, 24 hours around the clock, we allow ourselves and our children to be whole-body-irradiated by new, man-made electromagnetic fields for the entirety of our lives?"

We have a few answers. Last May, the International Agency for Research on Cancer (IARC, a branch of the World Health Organization), in Lyon, France, issued a statement that the electromagnetic frequencies from cell phones would henceforth be classified as "possibly carcinogenic to humans." The determination was based in part on data from a 13-country study, called Interphone, which reported in 2008 that after a decade of cell phone use, the risk of getting a brain tumor -- specifically on the side of the head where the phone is placed -- goes up as much as 40 percent for adults. Israeli researchers, using study methods similar to the Interphone investigation, have found that heavy cell phone users were more likely to suffer malignant tumors of the salivary gland in the cheek, while an independent study by scientists in Sweden concluded that people who started using a cell phone before the age of 20 were five times as likely to develop a brain tumor. According to a study published in the International

Journal of Cancer Prevention, people living for more than a decade within 350 meters of a cell phone tower experience a four-fold increase in cancer rates.

The IARC decision followed in the wake of multiple warnings, mostly from European regulators, about the possible health risks of RF-EMFs. In September 2007, Europe's top environmental watchdog, the EU's European Environment Agency, suggested that the mass unregulated exposure of human beings to widespread radiofrequency radiation "could lead to a health crisis similar to those caused by asbestos, smoking and lead in petrol." That same year, Germany's environmental ministry singled out the dangers of RF-EMFs used in Wi-Fi systems, noting that people should keep Wi-Fi exposure "as low as possible" and instead choose "conventional wired connections." In 2008, France issued a generalized national cell phone health warning against excessive cell phone use, and then, a year later, announced a ban on cell phone advertising for children under the age of 12.

In 2009, following a meeting in the Brazilian city of Porto Alegre, more than 50 concerned scientists from 16 countries -- public health officials, biologists, neuroscientists, medical doctors -- signed what became known as the Porto Alegre Resolution. The signatories described it as an "urgent call" for more research based on "the body of evidence that indicates that exposure to electromagnetic fields interferes with basic human biology."

That evidence is mounting. "Radiofrequency radiation has a number of biological effects which can be reproducibly found in animals and cellular systems," says David O. Carpenter, director of the Institute for Health and the Environment at the State University of New York (SUNY). "We really cannot say for certain what the adverse effects are in humans," Carpenter tells me. "But the indications are that there may be -- and I use the words 'may be' -- very serious effects in humans." He notes that in exposure tests with animal and human cells, RF-EMF radiation causes genes to be activated. "We also know that RF-EMF causes generation of free radicals, increases production of things called heat shock proteins, and alters calcium ion regulation. These are all common mechanisms behind many kinds of tissue damage."

Double-strand breaks in DNA -- one of the undisputed causes of cancer -- have been reported in similar tests with animal cells. Swedish neuro-oncologist Leif Salford, chairman of the Department of Neurosurgery at Lund University, has found that cell phone radiation damages neurons in rats, particularly those cells associated with memory and learning. The damage occurred after an exposure of just two hours. Salford also found that cell phone EMFs cause holes to appear in the barrier between the circulatory system and the brain in rats. Punching holes in the blood-brain-barrier is not a good thing. It allows toxic molecules from the blood to leach into the ultra-stable environment of the brain. One of the potential outcomes, Salford notes, is dementia.

Other effects from cell phone radiofrequencies have been reported using human subjects. At Loughborough University in England, sleep specialists in 2008 found that after 30 minutes of cell phone use, their subjects required twice the time to fall asleep as they did when the phone was avoided before bedtime. EEGs (electroencephalograms) showed a disturbance of the brain waves that regulate sleep. Neuroscientists at Swinburne University of Technology in Australia discovered in 2009 a "power boost" in brain waves when volunteers were exposed to cell phone radiofrequencies. Researchers strapped Nokia phones to their subjects' heads, then turned the phones on and off. On: brain went into defense mode. Off: brain settled. The brain, one of the lead researchers speculated, was "concentrating to overcome the electrical interference."

Yet for all this, there is no scientific consensus on the risks of RF-EMFs to human beings.

The major public-health watchdogs, in the US and worldwide, have dismissed concerns about it. "Current evidence," the World Health Organization (WHO) says, "does not confirm the existence of any health consequences from exposure to low level electromagnetic fields." (The WHO thus contradicts the findings of one of its own research units.) The US Federal Communications Commission has made similar statements. TheAmerican Cancer Society reports that "most studies published so far have not found a link between cell phone use and the development of tumors." The cell phone industry's lobbying organization, CTIA-The Wireless Association, assures the public that cell phone radiation is safe, citing studies -- many of them funded by the telecom industry -- that show no risk.

Published meta-reviews of hundreds of such studies suggest that industry funding tends to skew results. According to a survey by Henry Lai, a research professor at University of Washington, only 28 percent of studies funded by the wireless industry showed some type of biological effect from cell phone radiation. Meanwhile, independently funded studies produce an altogether different set of data: 67 percent of those studies showed a bioeffect. The Safe Wireless Initiative, a research group in Washington, DC that has since closed down, unpacked the data in hundreds of studies on wireless health risks, arraying them in terms of funding source. "Our data show that mobile phone industry funded/influenced work is six times more likely to find 'no problem' than independently funded work," the group noted. "The industry thus has significantly contaminated the scientific evidence pool."

The evidence about the long-term public health risks of exposure to RF-EMFs may be contradictory. Yet it is clear that some people are getting sick when heavily exposed to the new radiofrequencies. And we are not listening to their complaints.

Take the story of Michele Hertz. When a local utility company installed a wireless digital meter -- better known as a "smart" meter -- on her house in upstate New York in the summer of 2009, Hertz thought little of it. Then she began to feel odd. She was a practiced sculptor, but now she could not sculpt. "I couldn't concentrate, I couldn't sleep, I couldn't even finish sentences," she told me. Hertz experienced "incredible memory loss," and, at the age of 51, feared she had come down with Alzheimer's.

One night during a snowstorm in 2010 her house lost power, and when it came back on her head exploded with a ringing sound -- "a terrible piercing." A buzzing in her head persisted. She took to sleeping on the floor of her kitchen that winter, where the refrigerator drowned out the keening. There were other symptoms: headaches and nausea and dizziness, persistent and always worsening. "Sometimes I'd wake up with my heart pounding uncontrollably," she told me. "I thought I would have a heart attack. I had nightmares that people were killing me."

Roughly one year after the installation of the wireless meters, with the help of an electrician, Hertz thought she had figured out the source of the trouble: It had to be something electrical in the house. On a hunch, she told the utility company, Con Edison of New York, to remove the wireless meter. She told them: "I will die if you do not install an analog meter." Within days, the worst symptoms disappeared. "People look at me like I'm crazy when I talk about this," Hertz says.

Her exposure to the meters has super-sensitized Hertz to all kinds of other EMF sources. "The smart meters threw me over the electronic edge," she says. A cell phone switched on in the same room now gives her a headache. Stepping into a house with Wi-Fi is intolerable. Passing a cell tower on the street

hurts. "Sometimes if the radiation is very strong my fingers curl up," she says. "I can now hear cell phones ringing on silent. Life," she says, "has dramatically changed."

Hertz soon discovered there were other people like her: "Electrosensitives," they call themselves. To be sure, they comprise a tortured minority, often misunderstood and isolated. They share their stories at online forums like Stopsmartmeters.org, the EMF Safety Network, and the Electrosensitive Society. "Some are getting sick from cell phones, some from smart meters, some from cell towers," Hertz tells me. "Some can no longer work and have had to flee their homes. Some are losing their eyesight, some can't stop shaking, most cannot sleep."

In recent years, I've gotten to know dozens of electrosensitives. In Santa Fe, New Mexico, I met a woman who had taken to wearing an aluminum foil hat. (This works -- wrap a cell phone in foil and it will kill the signal.) I met a former world record-holding marathoner, a 54-year-old woman who had lived out of her car for eight years before settling down at a house ringed by mountains that she said protected the place from cell frequencies. I met people who said they no longer wanted to live because of their condition. Many of the people I talked to were accomplished professionals -- writers, television producers, entrepreneurs. I met a scientist from Los Alamos National Laboratories named Bill Bruno whose employer had tried to fire him after he asked for protection from EMFs at the lab. I met a local librarian named Rebekah Azen who quit her job after being sickened by a newly installed Wi-Fi system at the library. I met a brilliant activist named Arthur Firstenberg, who had for several years published a newsletter, "No Place to Hide," but who was now homeless, living out of the back of his car, sleeping in wilderness outside the city where he could escape the signals.

In New York City, I got to know a longtime member of the Institute of Electrical and Electronics Engineers (IEEE) who said he was electrosensitive. I'll call him Jake, because he is embarrassed by his condition and he doesn't want to jeopardize his job or his membership in the IEEE (which happens to have for its purpose the promulgation of electrical technology, including cell phones). Jake told me how one day, a few years ago, he started to get sick whenever he went into the bedroom of his apartment to sleep. He had headaches, suffered fatigue and nausea, nightsweats and heart palpitations, had blurred vision and difficulty breathing and was blasted by a ringing in the ears -- the typical symptoms of the electrosensitive. He discovered that his neighbor in the apartment building kept a Wi-Fi transmitter next door, on the other side of the wall to his bedroom. When Jake asked the neighbor to shut it down, his symptoms disappeared.

The government of Sweden reports that the disorder known as electromagnetic hypersensitivity, or EHS, afflicts an estimated 3 percent of the population. A study by the California Department of Health found that, based on self-reports, as many as 770,000 Californians, or 3 percent of the state's population, would ascribe some form of illness to EMFs. A study in Switzerland recently found a 5 percent prevalence of electrosensitivity. In Germany, there is reportedly a 6 percent prevalence. Even the former prime minister of Norway, Dr. Gro Harlem Brundtland, until 2003 the director general of the World Health Organization, has admitted that she suffers headaches and "strong discomfort" when exposed to cell phones. "My hypersensitivity," she told a Norwegian newspaper in 2002, "has gone so far that I react to mobile phones closer to me than about four meters." She added in the same interview: "People have been in my office with their mobile hidden in their pocket or bag. Without knowing if it was on or off, we have tested my reactions. I have always reacted when the phone has been on -- never when it's off."

Yet the World Health Organization -- the same agency that Brundtland once headed -- reports "there is no scientific basis to link EHS symptoms to EMF exposure." WHO's findings are corroborated by a 2008 study at the University of Bern in Switzerland which found "no evidence that EHS individuals could detect [the] presence or absence" of frequencies that allegedly make them sick. A study conducted in 2006 at the Mobile Phone Research Unit at King's College in London came to a similar conclusion. "No evidence was found to indicate that people with self-reported sensitivity to mobile phone signals are able to detect such signals or that they react to them with increased symptom severity," the report said. "As sham exposure was sufficient to trigger severe symptoms in some participants, psychological factors may have an important role in causing this condition." The King's College researchers in 2010 concluded it was a "medically unexplained illness."

"The scientific data so far just doesn't help the electrosensitives," says Louis Slesin, editor and publisher of *Microwave News*, a newsletter and website that covers the potential impacts of RF-EMFs. "The design of some of these studies, however, is questionable." He adds: "Frankly, I'd be surprised if the condition did not exist. We're electromagnetic beings. You wouldn't have a thought in your head without electromagnetic signals. There is electrical signaling going on in your body all the time, and the idea that external electromagnetic fields can't affect us just doesn't make sense. We're biological and chemical beings too, and we know that we can develop allergies to certain biological and chemical compounds. Why wouldn't we also find there are allergies to EM fields? Shouldn't every chemical be tested for its effects on human beings? Well, the same could be said for each frequency of RF radiation."

Dr. David Carpenter of SUNY, who has also looked into electrosensitivity, tells me he's "not totally convinced that electrosensitivity is real." Still, he says, "there are just too many people with reports of illness when chronically near to EMF devices, with their symptoms being relieved when they are away from them. Like multiple chemical sensitivity and Gulf War Syndrome, there is something here, but we just don't understand it all yet."

Science reporter B. Blake Levitt, author of *Electromagnetic Fields: A Consumer's Guide to the Issues*, says the studies she has reviewed on EHS are "contradictory and nowhere near definitive." Flaws in test design stand out, she says. Many with EHS may be simply "too sensitized," she believes, to endure research exposure protocols, possibly skewing results from the start by inadvertently studying a less sensitive group. Levitt recently compiled some of the most damning studies of the health effects from cell towers in a report for the International Commission on Electromagnetic Safety in Italy. "Some populations are reacting poorly when living or working within 1,500 feet of a cell tower," Levitt tells me. Several studies she cited found an increase in headaches, rashes, tremors, sleep disturbances, dizziness, concentration problems, and memory changes.

"EHS may be one of those problems that can never be well defined -- we may just have to believe what people report," Levitt says. "And people are reporting these symptoms all over the globe now when new technologies are introduced or infrastructure like cell towers go into neighborhoods. It's not likely a transcultural mass hallucination. The immune system is an exquisite warning mechanism. These are our canaries in the coal mine."

Swedish neuroscientist Olle Johansson was one of the first researchers to take the claims of electrosensitivity seriously. He found, for example, that persons with EHS had changes in skin mast cells -- markers of allergic reaction -- when exposed to specific EM fields. Other studies have found that radiofrequency EMFs can increase serum histamine levels -- the hallmark of an allergic reaction.

Johansson has hypothesized that electrosensitivity arises exactly as any common allergy would arise -- due to excessive exposure, as the immune system fails. And just as only some people develop allergies to cats or pollen or dust, only some of us fall prey to EM fields. Johansson admits that his hypothesis has yet to be proven in laboratory study.

One afternoon not long ago, a nurse named Maria Gonzalez, who lives in Queens, New York, took me to see the cell phone masts that irradiate her daughter's school. The masts were the usual flat-paneled, alien-looking things nested together, festooned with wires, high on a rooftop across from Public School 122 in Astoria. They emitted a fine signal -- five bars on my phone. The operator of the masts, Sprint-Nextel, had built a wall of fake brick to hide them from view, but Maria was unimpressed with the subterfuge. She was terrified of the masts. When, in 2005, the panels went up, soon to be turned on, she was working at the intensive care unit at St. Vincent's Hospital. She'd heard bizarre stories about cell phones from her cancer-ward colleagues. Some of the doctors at St. Vincent's told her they had doubts about the safety of their own cellphones and pagers. This was disturbing enough. She went online, culling studies. When she read a report published in 2002 about children in Spain who developed leukemia shortly after a cell phone tower was erected next to their school, she went into a quiet panic.

Sprint-Nextel was unsympathetic when she telephoned the company in the summer of 2005 to express her concerns. The company granted her a single meeting that autumn, with a Sprint-Nextel technician, an attorney, and a self-described "radiation expert" under contract with the company. "They kept saying, 'we're one hundred percent sure the antennas are safe,'" Maria told me as we stared at the masts. "'One hundred percent sure! These are children! We would never hurt children.'" She called the office of Hillary Clinton and pestered the senator once a week for six months -- but got nowhere. A year later, Gonzalez sued the US government, charging that the Federal Communications Commission had failed to fully evaluate the risks from cell phone frequencies. The suit was thrown out. The judge concluded that if regulators for the government said the radiation was safe, then it was safe. The message, as Gonzalez puts it, was that she was "crazy ... and making a big to-do about nothing."

I'd venture, rather, that she was applying a commonsense principle in environmental science: the precautionary principle, which states that when an action or policy -- or technology -- cannot be proven with certainty to be safe, then it should be assumed to be harmful. In a society thrilled with the magic of digital wireless, we have junked this principle. And we try to dismiss as fools those who uphold it -- people like Gonzalez. We have accepted without question that we will have Wi-Fi hotspots in our homes, and at libraries, and in cafes and bookstores; that we will have wireless alarm systems and wireless baby monitors and wireless utility meters and wireless video games that children play; that we will carry on our persons wireless iPads and iPods and smart phones. We are mesmerized by the efficiency and convenience of the infotainment appendage, the words and sounds and pictures it carries. We are, in other words, thoughtless in our embrace of the technology.

http://www.alternet.org/story/153299/radiation_from_cell_phones_and_Wi-Fi_are_making_people_sick_--_are_we_all_at_risk

Are Cell Phones and Wi-Fi Hazardous to Your Health?

"You may not be able to see electropollution, but your body responds to it as though it were a cloud of toxic chemicals." —Ann Louse Gittleman, author of Zapped: Why Your Cell Phone Shouldn't Be Your Alarm Clock and 1,268 Ways to Outsmart the Hazards of Electronic Pollution

The latest form of environmental pollution — and one that industry, government and wireless consumers don't like to acknowledge — may be the most devastating threat to health yet: electromagnetic fields (EMFs). A few years ago, I was so concerned that I took a certification course in the detection and harmful effects of EMFs. What it taught me, above all, was how much the scientific community is learning daily, and how little we in the medical profession knew. This area was both frightening and daunting in its scope. I'm grateful that following Devra Davis's *Disconnect: The Truth About Cell Phone Radiation* we now have *Zapped* to educate the public on this serious issue.

The UK's BioInitiative Report of July 2007 (updated in 2009) describes hundreds of studies that link EMF exposure to Alzheimer's disease, ALS (Lou Gehrig's disease), brain fog, cardiovascular disease, miscarriage, infertility, insomnia, learning impairment, as well as anxiety and depression. Wireless technologies — like cell and cordless phones — produce microwaves that increase the permeability of the blood-brain barrier, leading to changes in brain chemistry. Even low-level EMFs can cause brain cells to leak.

That's not all: Although actual tissue heating does not occur, EMFs also cause breaks in DNA, speed up cell division, disrupting the orderly process of chromosome matching and detaching, and activate stress protein or heat shock proteins. And as Anne Louise Gittleman writes in *Zapped*:

Most disturbing of all, the Swedish National Institute for Working Life found that people using cell phones for 2,000 hours — a total most of us could easily rack up over the years — had a 240 percent increased risk for malignant brain tumors on the side of the head where they usually held their phone.

So, what do we do to avoid these dangers? I'm relieved that Gittleman, my friend and colleague and author of over 30 bestselling books, has tackled this topic. We'll learn that most of us don't need to give up all the digital and electronic gadgets that make life so much easier. To protect ourselves, we first need to recognize the risks and then make smart choices in how we use all the available technological wonders.

Why Are EMFs So Dangerous?

What most people don't realize is the human body is naturally electrified. From the organic computer that is your brain, which sends out sensory messages like hunger and pain, to the energy that pumps your heart and makes your muscles contract, electricity powers your body. This innate electromagnetism within you is so critical to your daily functioning that modern medicine uses it in diagnostic testing (including electrocardiograms and MRIs) and, increasingly, to heal.

The "body electric" is an exquisitely tuned and sensitive creation, but unfortunately, human beings (and animals) respond favorably to only a very small range of electromagnetic frequencies. And there's a big difference between the body's natural electricity and the man-made electromagnetic frequencies that surround us 24/7 today. According to *New York Times* reporter B. Blake Levitt in *Public Health SOS*:

Most living things are fantastically sensitive to vanishingly small EMF exposures. Living cells interpret such exposures as part of our normal cellular activities (think heartbeats, brainwaves, cell division itself, etc.) The problem is, man-made electromagnetic exposures aren't "normal." They are artifacts, with unusual intensities, signaling characteristics, pulsing patterns, and wave forms. And they can misdirect cells in myriad ways.

Some of this radiation — extremely low frequency (ELF) radiation in power lines, the radio frequency (RF)/microwave range where all things wireless live, intermediate frequencies ("dirty electricity" or freaky frequencies linked to sick building syndrome), and the highest frequencies (gamma and X-rays) — is more damaging than natural frequencies to which humans (and animals) have adapted over millennia. Today, most Americans are constantly exposed to artificial frequencies, given the rapidly escalating pace of microwave and wireless expansion.

The bottom line is that electropollution — from cell towers, computers, cordless and mobile phones, PDAs, Wi-Fi, even the electrical appliances and wiring in our homes, offices and public buildings — continuously disturbs the sympathetic nervous system. This, in turn, elevates the body's fight-and-flight response, raising levels of the stress hormone cortisol. Fluctuations in cortisol lead to a wide range of health concerns ranging from belly fat and thinning skin to accelerated aging, blood sugar imbalance, cardiovascular problems, erratic sleep patterns and mood disturbances. Dr. Stephen Sinatra elaborates on this issue in his new book, *Earthing.*

Your body responds to EMFs as though they were public enemy number-one, triggering what two-time Nobel Prize nominee Robert Becker, M.D., in his 1998 book *The Body Electric*, called "subliminal stress." While intellectually you don't recognize this kind of stealth stress the way you would overwork or being stuck in traffic when you're late for an important appointment, your body's internal antennae pick up on it in several ways, according the late scientist, Dr. W. R. Adey, from Loma Linda University:

- The flow of blood and oxygen shuts down to all except major organs like the brain and heart.
- Any systems — including digestion and immunity — that aren't necessary for fight or flight response are put on hold.
- Blood pressure and heart rate as well as blood sugar levels increase to prepare your body for danger.

Recent research by Magda Havas, Ph.D., associate professor of Environmental and Resource Studies at Trent University in Canada, shows that dirty electricity — EMFs in electrical wiring — can raise blood sugar levels in diabetics and people at risk for diabetes. "Exposure to electromagnetic pollution in its various forms may account for higher plasma glucose levels and contribute to the misdiagnosis of diabetes," she writes. Dr. Havas' website is a goldmine of information on the entire topic of EMF pollution, as is Dr. Mercola's EMF site!

Electromagnetic Hypersensitivity

There are "canaries in the coal mine" — hypersensitive individuals who are severely weakened by EMFs, and find themselves marginalized by the medical profession and society in general. Some must live in areas far from cell towers, Wi-Fi and the like. On a cellular level, these individuals have measurable damage to the mitochondria, the energy factories in each cell, and require reparative nutrients, for

starters. I recently heard from a concerned family member of a man who had been exposed over time to a cell tower beaming through his office window. Quite ill, he was nonetheless unwilling to move his office location as I suggested, and I didn't hear from them again. Ignoring the messenger, however, doesn't solve the problem.

Zap-Proof Your Children

Today, an estimated 31 million kids are on their cell phones close to four hours a day. Mobile phone companies are even marketing phones to preschoolers. Gittleman writes:

The trouble is, kids absorb 50 percent more electropollution than adults. One study finds that a cell phone call lasting only two minutes can cause brain hyperactivity that lasts up to an hour in children. Because their skulls are smaller and thinner than adults, EMFs penetrate much deeper into children's brains. Kids' brains are also more conductive due to their higher water and ion concentration.

The Toronto Board of Health recommends that children under eight use cell phone only for emergencies and that teens limit calls to under 10 minutes. If your kids have cell phones, encourage them to use the same smart tips you do.

Smart Use of Technology

The good news is most of us don't have to give up our smartphones if we use them wisely. Here are some of the many tips Gittleman highlights in *Zapped:*

- Text, don't talk, whenever possible.
- Use speaker mode to keep your phone as far away from your head as possible.
- Go offline — turn off your cell phone when you're not using it and shut off your wireless router at night. (You'll be amazed how much more soundly you'll sleep.)
- Get your phone out of your pocket; men who carry their mobile there have lower sperm counts than those who don't carry a cell phone.
- Avoid tight spaces (buses, elevators, trains, and subways) where your phone has to work harder to get a signal out through metal.
- Buy low, choosing a phone with a low SAR (specific absorption rate) number.
- Replace your cordless phones with corded landline phones.
- Don't cradle your laptop—putting it on your lap exposes your reproductive organs to EMFs.
- *Most important of all, restrict cell and cordless phone use during pregnancy. Heavy phone use then has been linked to increased risk of miscarriage and birth defects. And a 2008 survey of more than 13,000 children found that those whose mothers used a cell phone during pregnancy were more likely to have behavior problems like hyperactivity and trouble controlling their emotions.*

Don't rely on the many stick-on devices available for your cell phone or computer that claim to protect you. Most are sold via network marketing, and I have yet to see the level of scientific proof that could convince me. You'll likely see comments to this blog, advertising them. *Caveat emptor*!

Even if you go back to wired technologies at home, Wi-Fi is expanding rapidly into schools and other public buildings. If the telecommunications industry has its way, we will all be bathed in a sea of artificial radiation from nonstop EMF exposure.

Due to their lobbying efforts, Section 704 of the Telecommunications Act of 1996 makes state and local governments powerless to prohibit cell towers and wireless antennas based on "environmental (i.e., human) health concerns." Write your congressmen and senators to change this legislation and to require the FCC to reduce exposure guidelines for EMFs.

Don't wait for the government to protect you, though.

http://www.huffingtonpost.com/hyla-cass-md/cell-phone-and-Wi-Fi-dange_b_758167.html

Canadian Tech Leader Warns of Wi-Fi, Smartphone, Cell Tower Radiation

The former president of Microsoft Canada is among those warning about the dangers of Wi-Fi and electromagnetic radiation exposure, and he's heading up initiatives to find safe alternatives to current wireless uses.

Frank Clegg, a leader on the Canadian technology scene for many years, says he supports those parents and concerned individuals who object to wireless Internet in schools.

"This is a real hazard and we shouldn't wait for the government to catch up to the technology," said Clegg, who was head of Microsoft Canada for nearly 15 years and now leads a national organization called Citizens 4 Safe Technology (C4ST). "We should exercise caution, especially with children."

Still generating heated arguments on both sides, exposure to electromagnetic radiation (generated by cellphones, smartphones, tablets and other wireless gadgets, as well as the towers, routers and meters that are part of the wireless Internet infrastructure) is seen by some as too low level, too short duration, too far a distance, to be of any significant medical concern.

Others maintain that causal links can be found between electro-magnetic radiation exposure and ill health, and treatment is now available at some hospitals for EMS, electro-magnetic hyper-sensitivity, an umbrella term used for medical issues related to cell phone use, wireless radiation and other related concepts.

Even a slight suspicion of such a connection should warrant a slower, more cautious approach to the use of wireless devices, groups like C4ST maintain, and especially any new installations of wireless transmitters in public spaces like schools or hospitals.

Clegg's run as president of Microsoft Canada ended in late 2005, a successful term in which the company grew from less than 100 hundred employees to over 700, while increasing revenue from about $50 million to more than $1 billion in sales.

His engagement with the tech community did not end, however, and following successful charges at both real estate and investment, he began dedicating much of his time to issues of tech safety and security: he worked with the Canadian charity KINSA, the Kids' Internet Safety Alliance, fighting against the online exploitation of children.

Now, with C4ST, he's working with a volunteer-based group of concerned citizens and researchers who want to work with industry and government to raise awareness about EMR and more closely integrate such information with public policy.

One way to raise awareness about wireless transmissions is to measure them.

That's the take at the Microwave Vision Group, a tech manufacturer that is showing its personal EMF monitoring device, the EME Spy 140, at various industry events and trade shows.
"This is a real hazard and we shouldn't wait for the government to catch up to the technology," said Clegg, who was head of Microsoft Canada for nearly 15 years and now leads a national organization called Citizens 4 Safe Technology (C4ST). "We should exercise caution, especially with children."

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http://whatsyourtech.ca/2013/05/29/canadian-tech-leader-warns-of-wi-fi-smartphone-cell-tower-radiation/

Do Cell Phone and Wi-Fi Fields Harm Our Bodies?

Studies suggest common forms of household radiation deserve more attention

Life requires energy. This isn't something mystical, it's biology. Electric impulses flow through our nerves, cells, and muscles—basically every cell and system in the human body carries a charge. This energy helps our bodies move and function.

But our energy environment isn't what it used to be. Over the last few decades, more energy fields have pervaded our world. Some come from power lines; others are emitted from cellphone towers in the form of 2G, 3G, and 4G networks. Still others emanate from Wi-Fi hotspots and the high-frequency WiMAX.

These energy fields are generated for operating our devices and technology, but in combination they may be affecting our bodies in a negative way. Some research suggests that the fields collectively known as electromagnetic radiation (EMR) or electromagnetic fields (EMF) interfere with our body's natural processes—even damaging our DNA.

In 2007 (and again in 2012), a group of scientists and public health experts released a report suggesting people reconsider our relationship with these energy fields. Known as the BioInitiative Report, its aim is to assess scientific evidence on how EMFs impact our health.

The conclusion is that we need to drastically reduce our EMF exposure.

"Not everything is known yet about this subject; but what is clear is that the existing public safety standards limiting these radiation levels in nearly every country of the world look to be thousands of times too lenient," states the report. "Changes are needed."

Meanwhile, other scientists insist that these energy fields cause no harm to humans. The BioInitiative Report is widely criticized by industries around the world because it only considers science that supports its own position and doesn't acknowledge research that suggests that EMFs are safe.

The World Health Organization (WHO) has been investigating the research on both sides. In 2011, the WHO's International Association for Research on Cancer (IARC) classified EMF radiation above the radio frequency range (RF-EMF) as a Class 2B carcinogen, which means it may cause cancer, but further research is necessary. This is due to evidence that links long-term wireless exposure to brain cancer.

However, recent research prompted some IARC panelists to take a stronger stance.

"RF-EMF should be regarded as a human carcinogen requiring urgent revision of current exposure guidelines," stated IARC scientist and Swedish oncologist Dr. Lennart Hardell in a 2014 edition of the International Journal of Environmental Research and Public Health.

Despite growing evidence of harm caused by EMFs, U.S. public health officials have been skittish about using language that might suggest EMFs pose health risks. In 2014, the Centers for Disease Control issued a public statement urging caution with cell phone use, but retracted the statement just a few weeks later.

However, in the U.K., Belgium, Russia, France, Israel, India, and elsewhere, regulators are taking EMF exposure, particularly wireless technology, much more seriously. In these countries, warnings are made clear and young children are discouraged from using this technology.

One of the contributing authors to the BioInitiative Report is Dr. Martin Blank, a scientist, lecturer, and retired professor from the Columbia University College of Physicians and Surgeons. He has investigated the cellular and biological effects of EMFs. The New York-born Blank now lives in Victoria, Canada, and has doctorates in both physical chemistry and colloid science.

Epoch Times spoke with Blank about why there is so much controversy among scientists over the safety of EMFs, and why children are most at risk.

Epoch Times: There are many frequencies in our environment today: cellular technology and Wi-Fi, on top of the energy that comes into our house through power lines. I'm tempted to call all of it electromagnetic radiation. Is that correct?

Dr. Martin Blank: Technically, no. To get radiation, you really have to get the electric and magnetic fields acting together so that the electric field will cause the electrons to move, which will generate a magnetic field. They get intertwined. And it's only when this is happening so fast up at the radiofrequency range that you can get the true blending.

The differences get smoothed out when you get to the radiofrequency range and higher. For example, the new 5G that's coming out, that's in the radiofrequency range. The 4G is radiofrequency. The 2G is electromagnetic.

Epoch Times: Some scientists insist that these energy fields are at too low a frequency to affect our bodies in any negative way. What do you think?

Dr. Blank: I've had this discussion many, many years ago with physicists who say this can't do anything if it's below thermal level. The answer is no. These effects occur at very low levels. They occur down at the ELF range (60 hertz).

Some of the things I studied were the basic enzymatic actions that cause ion movement in cells.

A very basic enzyme has a threshold level of 3 milligauss or 4 milligauss (a unit to measure magnetic fields). When people talk about radiofrequency stuff, this is thousands of times higher energy. There's no question that even very minute forces can have an effect on a biological system.

Epoch Times: What does the science say in terms of the impact these frequencies have on our health?

Dr. Blank: This is a complex thing, but we studied a few enzymes and they are all affected. If you're a lone electron sitting in the middle of nowhere and there's a field nearby, you're going to respond to those fields at relatively low levels.

For a system, you need a slightly stronger force to be able to cause a change in it. But we get changes in the functioning of cells with relatively small fields. That's been shown.

When you go higher than the normal range you can get damage. In 1995, Henry Lai published a paper showing that if you took DNA and subjected it to radiation, 60-hertz stuff, you got fragments coming off. You were breaking off parts of the molecule. There was a lot of controversy about this, and forces against this finding.

This is damage that is not repairable. When you break a piece of DNA, you've broken the code. It's not like when you get a cut and the skin heals. If you damage the DNA, that's called a mutation, and you affect the function of a cell. So depending on where the damage has occurred, you can cause a lot of problems.

Epoch Times: How is this bad? What purpose does DNA serve in our body?

Dr. Blank: When I learned about DNA in high school, I was taught that this was hereditary stuff.

But when I learned biology at the university level, they taught that DNA does everything all the time. It has the whole code in it. You need the DNA to keep the system going. It's telling the body which proteins to make and which systems to turn on. It's upgrading all the time, and if you cause damage in that thing, you're causing a lot of problems in the cell.

Often cells can't survive this DNA damage, but the body has a lot of resilience. You can cause damage to DNA, and some other part will take over and get it to function. This is why our species survives.

Epoch Times: Are these fields more harmful to children?

Dr. Blank: There is no question in my mind that children are far more vulnerable. This is accepted by people who understand how this radiation works, and understand the difference between children and adults.

Biologically, when we compare an adult and a child, the child has a thinner cranium bone and the nerves in their brain are not as fully myelinated. This means the child will get more penetration as a result of the same kind of exposure. And of course a child is still growing, so whatever damage is done is going to propagate.

Epoch Times: I've read that other countries are taking this more seriously.

Dr. Blank: Yes. France, for example. They made it a big thing when the National Library in Paris rejected the use of the Wi-Fi system.

Epoch Times: Are there any precautions that you personally take to limit your own exposure?

Dr. Blank: I do own a cellphone, but I only use it when I go to the States, and I only use it if I have to. I don't have Wi-Fi. You need a certain amount of this technology in order to do certain things, but I try to live without it.

Some of these things you can opt out of, but I think it's going to become harder and harder to avoid this kind of thing as they put up more and more of these antennas around neighborhoods.

As a civilization, we believe that progress is good and that we should buy into it. But sometimes new things aren't always to our benefit.

http://www.theepochtimes.com/n3/2155494-do-cell-phones-and-wi-fi-fields-harm-our-body/

Cell Phones & Wi-Fi – Are Children, Fetuses and Fertility at Risk?

Dedication to Ronald Herberman, MD

The program June 28, 2013 was dedicated to the late Ronald B. Herberman, Founding Director of the University of Pittsburgh Cancer Institute, Vice Chancellor of Cancer Research at University of Pittsburgh and the first head of an NCI funded cancer center to speak out on the risks from cell phones. He issued a warning of these risks to his 3,000 employees, addressed Congress, and, regarding inaccurate media reporting on cell phone radiation health risks in the *Economist*, Dr. Herberman said:

A disservice has been done in inaccurately depicting the body of science, which actually indicates that there ARE biological effects from the radiation emitted by wireless devices, including damage to DNA, and evidence for increased risk of cancer and other substantial health consequences…The public the world over has been misled by this reporting."

May we all find within us the courage Dr. Herberman repeatedly exhibited during his life, and share the knowledge found herein about risks to fertility, children and fetuses. Children have the most to lose from society's egregious irresponsibility in this matter.

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Conference Highlights: Discussion of Key Evidence that EMFs Negatively Impact Children, Fetuses and Fertility

The panel presented a wide range of scientific evidence that electromagnetic radiation of the kind emitted by portable phones, Wi-Fi routers, baby monitors, Bluetooth earpieces, towers, antennas, smart boards, smart meters, Google glass, and other wireless devices, is adversely affecting people across the globe, and especially children. This radiation may be 'non-thermal', but has clear and indisputable biological and health effects. Based on the DNA effects alone, there should be no delay in acting to protect the human species.

DNA is being damaged, and natural repair processes impaired, in this unnatural 24/7 bath of radiation. Children are especially vulnerable to DNA effects due to rapid growth and development of cells, as well as a longer lifetime of exposure. All frequencies react similarly with DNA, whether higher frequency or lower frequency. Some effects occur faster, some occur slower, but the effects are happening all the same. Cancer is believed to result from changes in DNA. DNA's coil of coil structure makes it exquisitely sensitive to EMF, more than other tissue in the body. The long-term impact for our species is of great concern as there is no evidence our bodies can adapt to these unnatural frequencies.

An increasing number of people listen, learn and think better in electromagnetically clean environments. The audience was asked to turn off their cell phones and wireless devices for this reason.

Cell phones, tablets and other wireless devices also have batteries that emit *lower frequency forms* of

radiation—and these, too, along with RF and microwaves, have consequences, such as increased risk for childhood asthma and obesity when exposed in utero, and increased risk of miscarriage.
Impacts of electromagnetic fields on children*:

→ Research shows radiation emitted by cell phones and Wi-Fi impacts children's development *in utero*, their cognitive function, attention, memory, perception, learning capacity, energy, emotions and social skills.

→ There is also diminished reaction time, decreased motor function, increased distraction, hyperactivity, and inability to focus on complex and long-term tasks.

→ Cellular devices can lead to a heightened sense of anxiety in children, to isolation, and feelings of psychological and physical dependency.

→ There are now 9 types of cancer linked to cell phone use:

1. Glioma (Brain Cancer)
2. Acoustic Neuroma (tumor on acoustic nerve)
3. Meningioma (tumor of the meninges)
4. Salivary Gland cancer (parotid gland in cheek)
5. Eye Cancer
6. Testicular Cancer
7. Leukemia
8. Thyroid Cancer
9. Breast Cancer

→ There is a direct relationship between duration of cell phone use and sperm count decline. Sperm count is reduced by half in men who carry cell phones in their pants pockets for four hours per day. The motility of the sperm is also impaired. The testicular barrier, that protects sperm, is the most sensitive of tissues in the body, and is 100x more absorbent. Besides sperm count and function, the mitochondrial DNA of sperm are damaged 3x more if exposed to cell phone radiation.

→ DNA mutations have been linked more to damage on the male side, in research from Iceland, the assumption being that male sperm is more vulnerable than female eggs, which are more protected, being deeper in the body.

Mutations increase with the age of the father, and more autism and schizophrenia increase with the age of the father.

→ Wi-Fi in homes depletes melatonin and leads to poor sleep quality and difficulty falling asleep.

→ Use of wireless devices after lights out has been associated with children's mental health risks and suicide.

→ Some of the most profound effects in children from *in utero* EMF exposure are emotional and behavioral.

→ Online time, particularly multi-tasking in young children, has been linked with a chronically distracted view of the world preventing learning critical social, emotional and relational skills.

→ There is imbalanced development of the right and left hemispheres of the brain, resulting in children having impaired ability to remember basic things, to use handwriting or to feel empathy. There is a physiological as well as psychological addiction that is taking place.

"Think about what it would be like to have an entire generation that has not developed the capacity for empathy."

—Devra Lee Davis, PhD MPH, Environmental Health Trust

Click to Watch Video:
Devra Davis, PhD,
Environmental Health Trust

→ Children are beginning to show signs of dementia, where they cannot remember basic things, a global phenomenon now being called "Digital Dementia", believed to potentially be irreversible. There are hundreds of digital detox camps in China and S. Korea; the first U.S. camp opened in Northern California this year.

→ Dr. Taylor summarized his recent study at Yale University: A standard cell phone with a SAR rating of 1.6W/kg was placed atop the cages of pregnant mice for the duration of their pregnancy. Their offspring showed hyperactivity, diminished memory, apathy, impulsiveness, and other behaviors, compared to unexposed controls, mirroring children with ADHD. The severity of the effect depended on the length of exposure.

Click to Watch Video:
Hugh Taylor, MD,
Yale University

→ Dr. Taylor said the incidence of ADHD in the U.S. is on the rise (3-5% of school aged children or 2mm children have ADHD) and the growth parallels the increased use of cell phones.

→ Besides observing behaviors in the mice, the Yale researchers also measured electrical activity in the brain of the exposed and unexposed mice. They found the mice that had been exposed briefly in utero had changes to the electrical signaling processes in the brain as adults. Note, the mice had only been exposed during pregnancy, not subsequently, but the brain function was "permanently altered".

There appears to have been a dose-response relationship, where the longer the mice had been exposed per day during the study the greater the changes in brain function. Continuous exposure throughout pregnancy was much more dangerous than briefer exposures.

→ Dr. Taylor reminded the audience that while we don't think of ourselves as being on the cell phone 24 hours a day, the cell phone is still emitting radiation 24/7 and impacting us if it is turned on and near us, day or night. "It's not talking on the phone that matters, it's any time the phone is turned on", he said. Every 900 milliseconds, whether you are using the phone or not, your cell phone has a spike in radiation because it is looking for a signal from the tower, according to Dr. Davis.

→ Researchers at UCLA found that children of mothers who used cell phones most frequently during pregnancy showed nearly a two-fold increase in behavioral and emotional problems and hyperactivity by the time they reached school age. Dr. Hugh Taylor stated:

> *When you combine data like this—studies that show there is in fact an association in humans, with our studies in animals—it is clearly cause and effect."*

→ Wi-Fi in schools is an 'enormous problem'. Some schools install massive, industrial strength routers right next to where children sit. Symptoms reported by children who sit near Wi-Fi routers include nausea, headaches, blurred vision, and poor sleep. The Israeli Health Ministry issued a report recommending against Wi-Fi in schools because there is simply no information about the long-term effects of this type of chronic exposure.

→ Russians caused the same EHS symptoms in the U.S. Embassy in cold war. Symptoms of electrohypersensitivity in Wi-Fi environments—of fatigue, irritability, concentration difficulty—are the same symptoms experienced by US Embassy personnel in Moscow in the cold war, that came to be known as microwave syndrome (or radiowave sickness).

→ There are reports of children dropping dead in Canada, or needing to wear pacemakers, after Wi-Fi installation in their schools.

→ Dr. Blank presented a simple study done by Danish high school girls wanting to study biological effects of Wi-Fi. They took cress cells and exposed half to Wi-Fi for 12 days. At left are the unexposed and exposed cress cells. The effects of Wi-Fi on this plant were made clear.

→ Turkish scientists recently discovered that mice exposed to cell phone radiation produced offspring with smaller brains, and more brain, liver, and eye damage. The Turkish government is launching a major campaign to raise awareness about cell phone radiation safety specifically geared towards pregnant women and young men interested in fathering healthy children.

→ Prenatal exposure results in fewer cells in the hippocampus of the brain, the area we need for thinking, reasoning, judgment and significantly impairs the development of neurons in the brain.

→ There is also irreversible DNA damage occurring from these devices, which effects the functioning of the child's body, and the quality of the genes they then pass on to future generations. Human cells, like all matter, are made up of charged particles, and these particles respond to EMFs. DNA has many different lengths and responds differently to various radiation frequencies—like different length antennas—and many effects are irreversible. DNA damage and mutations can cause cancer and other illnesses, but it can take years to detect symptoms.

> *The range of frequencies used today can cause damage to DNA, at levels that are currently being used."*

—Martin Blank, PhD, Special Lecturer and Retired Associate Professor of Physiology and Cellular Biophysics, Columbia University

→ Fetal effects from cellphone and wireless include faster heart rates, genetic changes, altered brain development, and increased behavioral and emotional problems after birth.

→ The strongest evidence for EMF effects are the science showing the connection between cell phone

use and brain cancer (Hardell 2008, Kundi 2008), according to Dr. Carpenter. The latency period between cell phone use and brain cancer is thought to be 20 to 30 years. Brain cancer rates are double for people who've been using cell phones for 10 years or more, appearing on the side of the head where they hold their phones, and risks are 5x greater for children using cell phones under the age of 20 than those over the age of 50.

→ Because children's nervous systems are still developing, synapses and myelin are being laid down continuously. For the body to create proteins, it must have correct DNA coding. EMFs break DNA apart, resulting in bad coding and mutations that result in poor brain function. Teenagers and children using cell phones before the myelination process is completed in the 20s are unknowingly causing a "whopping impact" on their brains.

→ There is some evidence that DNA mutations resulting from radiofrequency signals are part of what's driving today's increased autism and schizophrenia rates. The evidence was summarized in December in the landmark BioInitiative Report 2012 by Harvard Professor, Dr. Martha Herbert, MD who runs the Transcend Research Lab at Mass General.

 Dr. Herbert stated:

 *EMF/RFR from Wi-Fi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function. This will make it harder for some children to learn, particularly those who are already having problems in the first place."*

"Powerful industrial entities have a vested interest in leading the public to believe that EMF/RFR, which we cannot see, taste or touch, is harmless, but this is not true."

→ Radio towers, not just cell towers, are also a factor. Based on 50 years of data, the closer a child lives to a radio tower, the higher his or her risk for developing cancer. The standard for "safe" power density remains 1,000 times too high. A 6x risk of cancer is still considered 'safe', according to Dr. Martin Blank. Politics of EMF Science


Click to Watch Video:
Martin Blank, PhD,
Columbia University

No more research is needed in order to say with certainly that these effects are real, and there is sufficient cause to take action now to protect adults and children. While more research

will always be desirable to better understand certain connections, and to continue looking at the long-term trends with epidemiology, all members of the panel agreed there is sufficient scientific evidence today on which to take precautionary steps to minimize this radiation in our lives.

Click to Watch Video: Frank Clegg, Canadians 4 Safe Technology

Regulatory bodies have allowed a trillion dollar wireless industry to emerge without pre-market health testing or post-market health surveillance.

A whole generation of people has been unaware of the risks of wireless radiation, and have not been taking precautions. This is why public health officials are so concerned. There is already evidence that exposure to radiofrequency radiation in excess leads to disease. And exposures have grown dramatically in the last few years.

Our grandchildren and children are "being used as lab rats in an experiment with no controls….that's what we are doing with cell phone and wireless radiation with our children today."—Devra Davis, PhD, MPH. Environmental Health Trust

Scientists who expose the truth about the risks from electromagnetic fields are often intimidated and attacked, and their careers jeopardized. Industry-associated science is also designed to underestimate risks, thereby refuting the independent science and 'Manufacturing Doubt'. Esteemed scientists who publish widely sometimes find it hard to publish on this topic.

Just as Bill Moyers recently described was the case with suppression of evidence about lead("The Toxic Politics of Science") the wireless industry behaves as if risks from cell phones and wireless devices and infrastructure is 'a PR problem, not a public health problem'.

The FCC has inadequate exposure guidelines. US standards for radiofrequency/microwave exposure are based on an outdated, erroneous assumption that EMFs have no biological effects unless they cause tissue heating, like a high powered microwave oven heating your potato. *Science has disproven this myth*. The exposure guidelines fail to protect about 97 percent of the population, most especially children.

> *The cell phone standards we use today for the 6.5 billion cell phones in the world were set 17 years ago and have never been updated, despite the fact that the users and uses of cell phones are very different now. And they've never been tested for their safety around children…We're in the midst of a huge experiment on ourselves and on our children"*

—Devra Lee Davis, PhD, MPH, cancer epidemiologist and toxicologist, President of Environmental Health Trust, and author of Disconnect: The Truth About Cell Phone Radiation, What the Industry Is Doing to Hide It, and How to Protect Your Family

Lower power towers and devices are possible, though power levels are being continually increased. Cell phones and cell towers can be made safer, by using far less power. Also, many towers emit far more radiation than they claim.

Many countries are issuing advisories: Australia advises limiting children's exposure to cell phones; Belgium has banned sales of cell phones for use by children under age 7; Turkey has banned ads targeting sales to children. The French National Assembly has banned Wi-Fi in schools. Italy had a Supreme Court ruling in favor of a man who claimed his tumor was from cell phone use. A region of India, Rajasthan, has banned cell towers near schools, and won a court battle to defeat industries opposition. Standards in the Eastern block are 1,000 times stricter.

"It may take some sort of catastrophe to get people's attention."—Frank Clegg, former president of Microsoft Canada and founder of Canadians 4 Safe Technology, a member of the audience who later joined the panel to share his perspective.

Several panel members compared the current situation where the health risks of cell phone and wireless radiation are being downplayed, and the science suppressed or manipulated, to other well-known public health scandals driven by commercial interests, such as tobacco, lead, asbestos, DDT, Bisphenyl A, silica, vinyl chloride, PCBs, GMOs, pesticides in food, fracking, the neionicotinoid chemicals impacting bees.

Safety Recommendations

- Extreme caution was advised for pregnant women or women hoping to conceive due to the profound long-term impact known historically to occur from environmental factors. *"A lot of who we are right now has to do with what our mothers did when they were pregnant and what type of exposures they had."*—Hugh Taylor, MD, Chairman of Obstetrics and Gynecology and Reproductive Sciences, Yale University. As with DES and many other toxic substances, he said, the effects from exposure to the fetus may not appear for a generation.

- Children should not be playing with radiating cell phones. Young children should not be using cell phones, except in an emergency. If your child wants to play with the device, disconnect it from Wi-Fi and Internet, and put it in "airplane mode."

- Limit or eliminate Wi-Fi exposures. If you have Wi-Fi, get rid of it if you can. If you can't, make sure your router is not in a high use area. Keep it turned it off as much as possible, or put it on a timer. Make sure Wi-Fi is turned off at night. If your neighbors have Wi-Fi that reaches your home, shield your premises. Never use RF emitting devices in shielded premised.

- Schools should not have Wi-Fi. Panelists strongly opposed the installation of Wi-Fi in schools. Cabled/wired connections do not have the same risks. Push for no Wi-Fi in classrooms and No Wi-Fi zones for studying, and for at least one 100% No-Wi-Fi public school in your area.

- Resume using landline phones whenever possible. Get rid of your portable phone and use a landline instead. If you have a portable phone, don't sleep with the handset or base in your bedroom. Caution regarding 'Trimline' and other flat style phones, where the electronics for the speaker may be closer to your ear.

- Keep your cell phone away from your body. If you have a cell phone, keep it away from your body, as opposed to in your pocket or on your belt. If you're pregnant, keep it away from your belly. Keep your cell at the other end of the room, or on the seat of the car. Use texting more than talking to keep the device away from your skull. Special cell phone cases are available that filter out a significant portion of the radiation with a mechanical means, but not all. Many popular metal cases can actually magnify radiation. Fully shielded cases will be available through Electromagnetichealth.org. Please email info@ electromagnetichealth.org to receive announcement.

- Use a wired (non-bluetooth) earpiece with cell phones and portable phones.

- Caution about using cell phones in cars. Signals bounce around inside your vehicle—and your head is the antenna.

- Opt-out of new utility meters called 'smart meters'. When possible, prevent smart meters from being installed in your home. Reflect radiation away from your home with shielding paints and materials found at www.EMFSafetyStore.com

- Never use wireless baby monitors. Avoid the use of wireless baby monitors as they all operate on microwave frequency. Find the old analog models.

- Know your exposures. For about $500, you or your community can purchase an Electrosmog meter with which to measure the EMF in any particular area—homes, schools, churches, etc. Don't guess or assume—measure.

- EMF free zones are needed for pregnant women and children. "Wi-Fi free" or "low Wi-Fi" zones in public spaces should be designated for pregnant women and children and others who are sensitive to EMFs. The same applies in schools.

- We need to be tracking biological effects*. "We need to seriously begin tracking the biological effects of EMFs…We need to be monitoring our children's health routinely. We have to train people how to do the research, and we have to invest in the research that's not being done."*— Devra Lee Davis, PhD MPH

- Discuss the need to monitor health, mental health and DNA impacts of the widespread radiation with your representatives in Congress. Tell them research by telcom industry affiliated persons should be disallowed due to the importance of this subject.

- We must take precaution. "The precautionary principle is in order here—certain precautions should be taken as a result of the risk that's been identified. That's the reason we have seat belts in cars… not because every car is going to crash, but because we want to minimize the damage when they do."—Martin Blank, PhD

- A one-dollar fee has been proposed on the sale of all cell phones as a means of generating revenue for research and education. Over several years, such a levy would generate billions of dollars to finalize any unanswered questions about risks. Discuss such a levy with your representatives in Congress.

- Industry must become engaged. Strategies must be introduced to get industry involved, such as providing incentives or rewards for safer technology, or even amnesty. If all else fails, lawsuits, some of which are in the works, will get their attention.

- FCC safety guidelines must be updated. Outdated, unrealistic safety guidelines must be replaced with new ones that reflect modern biological science, such as those suggested in the BioInitiative Report 2012. In fact, the current guidelines are based on a false premise that non-heating waves do no harm, and this must be acknowledged to stop perpetuating this myth at our expense.

- Support labeling laws requiring cell phone manufacturers to list radiation levels in an obvious place on the packaging and at the retailer.

- Educated parents need to become involved, especially to protect our children. Contact www.ElectromagneticHealth.org or www.EnvironmentalHealthTrust.org to learn how your can become involved in raising awareness on this important children's health issue, or by funding research, media communications and support for education and remediation in local communities. Keep abreast on this subject going forward as it related to children, fetuses and schools at Facebook's Campaign for Radiation Free Schools.

http://electromagnetichealth.org/electromagnetic-health-blog/summary-and-audio/

New report: Wireless technology causes brain damage

In April 2014, the BioInitiative Working Group – consisting of 29 experts from ten countries, ten holding medical degrees, 21 PhDs, and three MsC, MA or MPHs – said there is growing evidence that wireless technology causes brain damage, cancer tumors plus a host of chronic health conditions.

Based on a review of the science released in 2012 and 2013, Lennart Hardell, MD, PhD at Orebro University, Sweden says, ""there is a consistent pattern of increased risk for glioma (a malignant brain tumor) and acoustic neuroma with use of mobile and cordless phones".

"We know that microwaves can cause genetic damage." – Barry Trower, a retired British military intelligence scientist and expert in microwave technology.

"Our grandchildren and children are being used as lab rats…" This quote is taken directly from Devra Davis, PhD, MPH, president of Environmental Health Trust. Dr. Davis is seriously concerned about the future of humanity. Our children are being exposed to a level of 'unnatural' microwave radiation which damages DNA and inhibits cellular repair – which leads to cancer. This is truly an unproven, mad experiment on humans with dire health consequences.

Here are some quick facts about the dangers of wireless technology:
1. In 2007, the BioInitiative Working Group released a 650-page document with over 2000 studies linking RF and EMF exposure to cancer, Alzheimer's disease, DNA damage, immune system dysfunction, cellular damage and tissue reduction.
2. In May 2011, the World Health Organization's International Agency for Research on Cancer categorized "radiofrequency electromagnetic fields as possibly carcinogenic to humans based on an increased risk for glioma, a malignant type of brain cancer, associated with wireless cellphone use."
3. In April 2012, the American Academy of Environmental Medicine (AAEM) – a national organization of medical and osteopathic physicians – concluded that, "genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system dysfunction, cognitive effects, protein and peptide damage, kidney damage, and developmental effects have all been reported in the peer-reviewed scientific literature."

http://www.naturalhealth365.com/wireless-technology-microwave-radiation-brain-damage-1243.html

Children's Health Expert Panel: Cell Phones & Wi-Fi—Are Children, Fetuses and Fertility at Risk?

"It may take some sort of catastrophe to get people's attention," said Frank Clegg, former president of Microsoft Canada and founder of Canadians 4 Safe Technology, referring to the increasing saturation of Wi-Fi technologies on the public at large, and especially, children.

Leading experts from top universities recently convened at a program organized by ElectromagneticHealth.org in Connecticut to discuss the reality that such a catastrophe is already brewing and, as the panel warned, is now already negatively impacting children, fetuses and fertility. But the majority of parents are not connecting the dots by linking symptoms in their children to the radiation.

During the discussion "Cell Phones & Wi-Fi – Are Children, Fetuses and Fertility at Risk?," a wide range of scientific evidence was presented that RF/MW electromagnetic radiation has indisputable biological and health effects, including at non-thermal levels, with chronic exposures generally associated with greater harm. This is the kind of radiation emitted not only by cell phones but also by:

- Wi-Fi routers
- Baby monitors
- Bluetooth earpieces
- Towers
- Antennas
- Smart boards
- Smart meters
- Cordless phones
- Other wireless devices

'Our Grandchildren and Children Are Being Used as Lab Rats…' This quote, from Devra Davis, PhD, MPH, president of Environmental Health Trust, sums up perhaps the most alarming EMF issue to date. The fact is, we know that exposure to this 'unnatural bath of radiation' damages DNA and impairs natural cellular repair processes, a phenomenon that may lead to cancer. Yet we are proceeding with this large-scale, uncontrolled experiment anyway.

Because children are still developing, they have rapid cellular replication and growth rates that make them especially vulnerable to DNA damage. They also have a longer lifetime exposure to this new pervasive radiation than any previous generation.

As the expert panel stated, research shows that radiation from cell phones and Wi-Fi has already been shown to cause diminished reaction time in children, decreased motor function, increased distraction, hyperactivity and inability to focus on complex and long-term tasks.

In one controlled study, researchers from Yale University positioned a cell phone above a cage of pregnant mice. The phone was transmitting an uninterrupted active call for the entire 17 days of gestation.

When the exposed offspring were later tested, they showed signs of ADHD, and reduced transmissions in the prefrontal cortex of the brain. It's widely known that children, due to their thinner skulls, smaller brains, softer brain tissue and far more rapidly dividing cells, are far more susceptible to damage from cell phone use than adults. This study clearly showed brain patterns are altered, with lifelong repercussions from brief prenatal exposures to microwave radiation.

Dr. Taylor indicated that there was a dose-response relationship found, and that disruption to the electrical signaling between neurons resulted in permanent changes in the way the brain is patterned that will carry forward into adulthood. The electrical signaling plays a major role in how the brain develops, which determines a lot of who we are as adults, he said, including "how we think and how we behave."

"This is the first experimental evidence that fetal exposure to radiofrequency radiation from cellular telephones does in fact affect adult behavior…" said Hugh Taylor, Professor and Chairman, Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University.

Camilla Rees, MBA of ElectromagneticHealth.org,2 said Dr. Taylor encouraged the audience to appreciate that while we don't think of ourselves as being on the cell phone 24 hours a day, the cell phone is still emitting radiation 24/7 and impacting us if it is turned on and near us, day or night.

"It's not talking on the phone that matters, it's any time the phone is turned on," he said. Every 900 milliseconds, whether you are using the phone or not, your cell phone has a spike in radiation because it is looking for a signal from the tower…"

She summarized key impacts on children from cell phone and Wi-Fi radiation drawn from the BioInitiative Report, the Mobilewise (UK) report on cell phone effects on children, Russian research overseen by the Chairman of the Russian National Committee on Non-Ionizing Radiation Protection, and the Yale report, "Cell Phones: Technology, Exposures, Health Effects."

Reference to the latest BioInitiative Report's (2012) section on possible EMF links to autism written by Harvard Professor Dr. Martha Herbert, who runs the Transcend Research Lab at Mass General, was also made. Dr. Herbert has said,

"EMF/RFR from Wi-Fi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function. This will make it harder for some children to learn, particularly those who are already having problems in the first place."

"Powerful industrial entities have a vested interest in leading the public to believe that EMF/RFR, which we cannot see, taste or touch, is harmless, but this is not true."

Several panelists mentioned the new condition "Digital Dementia," increasingly being reported globally, where children are exhibiting signs of deterioration in cognitive abilities from overuse of internet technologies, thought to result from imbalanced development of the brain. The lesser cognitive function

will also result from the RF/MW exposures, but researchers who are focused on 'overuse' have not been as aware of this factor.

More research is necessary here to ferret out how much of the behavioral and brain effects of technology overuse are coming from the RF/MW, or brain changing aspects use of the technology itself, and the resulting lesser human interaction and lower quality relationships.

An excellent new book by Raffi Cavoukian, renowned singer, children's champion and supporter of a commercial-free childhood, "#LightWebDarkWeb," takes a deep philisophical look at society's unquestioning embrace of these technologies for children. It covers the health, privacy, safety, security, social, societal, mental health and addiction issues from children's use of social media and modern communications technologies. Raffi says we need to "act quickly to subdue the perils of InfoTech's shadow," and "to move the risk-benefit ratio in favor of the LightWeb."

In light of the growing evidence for harm to children and fetuses, Dr. Davis explained:3

"The cell phone standards we use today for the 6.5 billion cell phones in the world were set 17 years ago and have never been updated, despite the fact that the users and uses of cell phones are very different now. And they've never been tested for their safety around children… We're in the midst of a huge experiment on ourselves and on our children…

A whole generation of people has been unaware of the risks of wireless radiation, and have not been taking precautions. This is why public health officials are so concerned. There is already evidence that exposure to radiofrequency radiation in excess leads to disease. And exposures have grown dramatically in the last few years. Our grandchildren and children are "being used as lab rats in an experiment with no controls… that's what we are doing with cell phone and wireless radiation with our children today."

Frank Clegg, formerly CEO of Microsoft Canada, also commented on the adequacy of safety guidelines: Clegg said he is disappointed with industry, and regrets the lack of responsibility demonstrated by the technology sector in turning a blind eye to the biological realities of this radiation.

Nine Types of Cancer are Linked to Cell Phone Use

It was back in 2011 that the International Agency for Research on Cancer (IARC), a committee of 27 scientists from 14 different countries working on behalf of the World Health Organization (WHO), concluded that exposure to cell phone radiation is a "possible carcinogen" and classified it into the 2B category -- the same category as the pesticide DDT, lead, gasoline engine exhaust, burning coal and dry cleaning chemicals, just to name a few. The children's health expert panel explained that, as of 2013, there are nine types of cancer linked to cell phone use, including:

- Glioma (brain cancer)
- Acoustic Neuroma (tumor on acoustic nerve)
- Meningioma (tumor of the meninges)
- Salivary Gland Cancer (parotid gland in cheek)
- Eye Cancer

- Testicular Cancer
- Leukemia
- Thyroid Cancer
- Breast Cancer

The science connecting cell phone and Wi-Fi radiation is among the strongest there is, and children, again, are slated to bear the brunt of what could become a new epidemic of cell-phone and Wi-Fi-induced cancers. The panel reported:

"The latency period between cell phone use and brain cancer is thought to be 20 to 30 years. Brain cancer rates are double for people who've been using cell phones for 10 years or more, appearing on the side of the head where they hold their phones, and risks are 5x greater for children using cell phones under the age of 20 than those over the age of 50."

Fertility and Sperm Count May Be at Risk

Infertility rates have been on the rise in the US, and today's children may be even worse off than their parents if current trends continue. Several of the panel members focused on this issue, including studies that have found cell phone radiation can affect men's sperm count and the quality and motility of their sperm. One such study, published in PLoS One,4 found:

"RF-EMR [radiofrequency electromagnetic radiation] in both the power density and frequency range of mobile phones enhances mitochondrial reactive oxygen species generation by human spermatozoa, decreasing the motility and vitality of these cells while stimulating DNA base adduct formation and, ultimately DNA fragmentation. These findings have clear implications for the safety of extensive mobile phone use by males of reproductive age, potentially affecting both their fertility and the health and wellbeing of their offspring."

The panel further reported:

"There is a direct relationship between duration of cell phone use and sperm count decline. Sperm count is reduced by half in men who carry cell phones in their pants pockets for four hours per day. The motility of the sperm is also impaired. The testicular barrier, that protects sperm, is the most sensitive of tissues in the body, and is 100x more absorbent. Besides sperm count and function, the mitochondrial DNA of sperm are damaged 3x more if exposed to cell phone radiation.

…DNA mutations have been linked more to damage on the male side in research from Iceland, the assumption being that male sperm is more vulnerable than female eggs, which are more protected. Mutations increase with the age of the father, and more autism and schizophrenia increase with the age of the father."

EMF-Free Zones Should Be Available for Pregnant Women and Children

The weight of the evidence clearly supports the need for Wi-Fi-free or low-Wi-Fi areas where pregnant women or those hoping to conceive, children and others sensitive to EMFs, can be protected, according to the panel.

The European Council has already taken the exemplary step of recommending that mobile phones and wireless networks get banned in classrooms and schools, according to Dr. Davis, and the Turkish government is launching a campaign to educate pregnant women and young men of reproductive age about the safety risks of cell phone radiation. Rajasthan India has banned cell towers on or near schools. The Israeli Health Ministry has issued a report recommending against Wi-Fi in schools, on the basis that not enough is known about its chronic exposure. It has been shown, however, that increasing numbers of people think and learn better in locations that are free of cell phones, wireless devices and other forms of EMFs.

The Israeli Supreme Court in July ordered the Israeli government to investigate how many Israeli students are suffering from electrosensitivity in response to a brief claiming that it is unreasonable to expose children to WI-FI when it is proven to cause sickness. The Government must submit the result of its investigation, supported with a sworn affidavit, to the court by November 16, 2013. Israel Minister of Health Rabi Yaakov Litzman wrote to the Minister of Education saying:

"I do fear that there will come a day that we will all cry because the irreversible damage that we, in our own hands cause the future generation."

The panel noted that 'extreme caution' is advised for pregnant women and women hoping to conceive:6

"Prenatal exposure results in fewer cells in the hippocampus of the brain, the area we need for thinking, reasoning, judgment and significantly impairs the development of neurons in the brain… Some of the most profound effects in children from in utero EMF exposure are emotional and behavioral."

Around the world, many countries are already adopting the Precautionary Principle regarding cell phone use, and this is also what the panel recommended. Russian officials have issued the recommendation that all children under the age of 18 should avoid using cell phones entirely. The UK, Israel, Belgium, Germany, India, France and Finland also urge citizens to err on the side of caution with respect to their children's use of cell phones. Panel member Martin Blank, PhD said:

"The precautionary principle is in order here – certain precautions should be taken as a result of the risk that's been identified. That's the reason we have seat belts in cars… not because every car is going to crash, but because we want to minimize the damage when they do."

Safety Recommendations for Cell Phone and Wi-Fi Use

The cell phone industry is one of the fastest growing and strongest global industries in the world today and is even stronger than the pharmaceutical industry. As a multi-trillion dollar industry that funds media around the world they are capable of making sizable political donations and persistent lobbying efforts that dictate government policies, and that also influence science carried out at universities and prominent cancer institutes.

So while cell phone dangers will one day likely be as well known as tobacco dangers, there's going to be a window when people are extremely vulnerable. And that window is right now. Children are especially

vulnerable to damage from cell phone radiation, and should not use them at all (or only for very limited amounts). Men and women who want to have healthy children need to take special precautions to protect their reproductive organs and should not keep phones in their front pockets or close to their abdomens.

In the US, public warnings are not yet commonplace, but it's still important to protect yourself – and your children. There is plenty of science showing harm to warrant taking action now

The panel advised:
◦Children should not play with radiating cell phones. Young children should not use cell phones except in an emergency. While you can put the phone in 'airplane mode,' which disconnects it from Wi-Fi and the Internet, the cell phone still emits magnetic fields from the battery, which have also been shown to have equally important biological consequences. In no cases should children sleep with cell phones. Extreme caution was advised for pregnant women or women hoping to conceive due to the profound long-term impact of environmental factors.
◦Limit or eliminate Wi-Fi exposures. If you have a WI-Fi router make sure your router is a low power version, not in a high-use area and keep it turned off as much as possible. Consider putting it on a timer so it is only available during certain hours, and never during sleeping hours.
◦Schools should not have Wi-Fi. Cabled/wired connections do not pose the same risks. If there is Wi-Fi, again, it should be limited to the time when the Wi-Fi is specifically needed and not be operating at other times. Ideally, classrooms and school libraries and gyms should be Wi-Fi-free.
◦ Resume using landline phones whenever possible. Get rid of your portable phone and use your landline. At the very least, don't keep your cell phone in your bedroom while you sleep. Be aware even landline phones emit magnetic fields from the speaker, and sensitive people can sometimes feel them, especially on long calls and particularly when using trim phones. Old-fashioned desk phone earpieces offer a greater distance between the speaker and your ear that can make a meaningful difference.
◦ Keep your cell phone away from your body. Avoid keeping it in your pocket or on your belt. If you're pregnant, keep your cell phone away from your belly. Keep your phone at the other end of the room or on the seat of the car. Use texting more than talking. A cell phone case for the iPhone is available that filters out a significant portion of radiation (but by no means all the power and frequencies and other biologically disruptive signal characteristics also remain). There are several options for shielded cell phone cases and holsters at www.EMFSafetyStore.com.
◦ Use a wired earpiece or headphones with cell phones. Like with landline phones, some people are impacted by the magnetic fields from the speaker in the ear buds, so choose a model with the greatest distance from your ear, or use air tube technology with no electronics near your ear.
◦ Use caution using your cell phone in your car. Signals bounce around inside your vehicle, and your head is the antenna.
◦ Opt-out of new utility meters called 'smart meters.' Prevent smart meters from being installed in your home whenever possible.
◦ Avoid using wireless baby monitors, as they all operate on microwave frequency. Look for the old wired monitors.
◦ Know your exposures.
◦ Support labeling laws that require cell phone manufacturers to list radiation levels in an obvious place on the packaging and at the retailer.

http://articles.mercola.com/sites/articles/archive/2013/09/21/cell-phone-Wi-Fi-radiation.aspx

Wi-Fi & Cell Phones Pose a Much Greater Danger Than Most People Realize

I've posted a few articles in prior years (links at the bottom) on the dangers of cell phone usage and the damaging health effects from microwave energy fields, but the two videos seen below add powerful evidence that holding a cell phone against your ear while talking is the dumbest thing you could possible do.

The damage to children, especially very young children, is exponentially greater than that of adults. If you care about your kids living a normal life span, do NOT give them a cell phone – ever.

Other microwave electronic devices such as Smart Meters and Wi-Fi computer components, are adding a tremendous burden of toxic, microwave EMF pollution to the body that is having a cumulative–and disastrous–effect.

Using a high quality, German microwave frequency analyzer last October to test the intensity of ambient microwave fields in my neighborhood, I was dumbfounded to discover that Wi-Fi routers used for internet access in many homes put out an ENORMOUS amount of microwave energy (600-1000 microwatts) that is being absorbed by the people living in that house 24/7.

It was shocking enough to see that our newly installed Smart Meters were putting out 1-2 WATTS every two minutes, but to see the added burden of Wi-Fi router radiation was stupefying. The safe level for human microwave exposure, according to Swiss and German environmental safety groups, is ONE MICRO watt per cubic meter. One watt is the equivalent of ONE MILLION micro watts.

While not mentioned in these videos, I've received information recently from a very sensitive medical intuitive who is discovering that many people are beginning to experience CALCIFICATION of organ and muscular tissue cell walls due to excessive exposure to high intensity microwave energy fields, such as those found in a home with a Wi-Fi router, Wi-Fi printer, Bluetooth mouse, smart meters, near cell phone towers, etc. It appears that the depositing of calcium into cell walls, normally composed of lipid (fat) cells, is the body's attempt to shield against the penetration of microwave energy fields into the nucleus of the cell, where our DNA strands reside in the chromosomes.

I met a young Japanese guy (32) recently who told me that he's had lower back pain and kidney pain for the past 3 years and doesn't know why since his doctor couldn't find anything wrong .I asked my medical intuitive friend to check, and sure enough, he's calcifying like a rock. If he doesn't take corrective action to pull that calcium out, he's going to be in big trouble within a few years. Obviously, stopping all exposure to microwave energy fields needs to be at the top of his priorities.

It is next to impossible to undo the damage from excessive microwave exposure to the brain once acquired, so it's imperative to AVOID the exposure in the first place. This is critically important when it comes to children.

https://wakeup-world.com/2012/09/13/find-out-the-facts-Wi-Fi-cell-phones-pose-a-much-greater-danger-than-most-people-realize/

Is Your Cordless Phone Harming Your Health?

The more I learn about wireless devices, the less I want them in my home. This includes cordless phones. The standard DECT (Digitally Enhanced Cordless Technology) phone utilizes a technology that utilizes a digital signal that is both powerful and clear.

It's what you'll readily find on store shelves. Look for 2.4 or 5.8 GHz when trying to identify a DECT phone. Manufacturers include Panasonic, GE, Motorola, AT&T, and V-Tech.

If you have concerns about WI-FI, you will want to have equal concern for DECT as they both operate with frequencies in the microwave and radio spectrum. In 2011 the World Health Organization (WHO) classified electromagnetic radiation as a possible 2B carcinogen. (The same category as lead, DDT, and styrene.)

Other wireless devices commonly found in the home include:

- Remote controls for opening gates
- Wireless security systems
- Wireless video cameras
- Wireless baby monitors
- Smart meters

DECT cordless phones continuously emit microwave radiation at full power as long as the base station is plugged into an electrical outlet. That means radiation is emitted 24 hours a day whether the phone is being used or sitting idle in its cradle.

Dr. Magda Havas is one of the premier researchers on the adverse impact of DECT phones. In a petition calling on the Canadian government to ban DECT phones, Dr. Havas points to the growing evidence linking DECT phones with ill health. By superimposing her studies with others, Dr. Havas created the following graphic to show that, even from a distance of 3 meters, EEG brain waves are altered.

Health effects of DECT phones, according to Dr. Havas,

"At 2.8 meters motor function, memory and attention of children are affected. At 1.7 meters, sleep is disturbed. How many people have DECT phones near their bed? At 30 cm memory is impaired and at closer distances the immune system is affected, REM sleep is reduced, insulin levels drop, and there are pathological changes in the blood brain barrier. Studies also show that there is 100% increase in adult leukemia between 45 and 130 cm from the phone and a similar increase in childhood leukemia between 35 and 260 cm."

Thankfully, it's easy to replace your DECT phone. Corded phones are readily available at electronics stores and online. If a portable home phone is your only option, consider the non-DECT 900 MHz analog phone that only emits radiation when in use.

Why not err on the side of caution and return to the old-fashioned corded phones. You may notice improvements in your sleep, concentration, and overall health!

http://it-takes-time.com/2015/06/01/health-effects-of-cordless-phones/

Wireless pollution 'out of control' as corporate race for 5G gears up

With the UK's Digital Economy Bill set to be finalized today, new 5G microwave spectra are about to be released across the planet without adequate safety testing, writes Lynne Wycherley. Global neglect of the Precautionary Principle is opening the way to corporate profit but placing humans and ecosystems at risk, and delaying a paradigm shift towards safer connectivity.

In *Drowning in a Sea of Microwaves*, the late geneticist Dr Mae-Wan Ho - a visionary voice who opposed GMOs - identified pollution from wireless technologies as a pressing issue of our times.

Noting evidence for *"DNA damage ... cancers, microwave sickness, [and], impairment of fertility"*, she concluded: *"Evidence is emerging that the health hazards associated with wireless microwaves are at least comparable to, if not worse than, those associated with cigarette smoking."*

Since the advent of radar, followed by mobile phones and dense Wi-Fi networks, such anthropogenic radiation has sky-rocketed. Although it is non-ionising, and does not destabilise molecules directly, evidence of other harm has been growing since 1950s studies on radar workers.

According to the updated *Bio-initiative Report* (2012+) by 29 precautionary scientists, effects on biology feature in several thousand, peer-reviewed papers. Yet troubling new findings rarely filter into the media. Or global Green discourse.

Though many studies have reported 'no significant effect', research by University of Washington biology professor Henry Lai, and others, reveals that wireless-industry funding is far more likely to yield such findings.

"Toujours ils créent doubte" ('they are forever creating doubt'), explains former Luxembourg Green MP Jean Huss, whose research on the wireless industry inspired the Council of Europe to call for many precautions (2011), including protection of warning scientists, and wired internet in schools.

But wireless-product marketing has a loud voice. Few of us realise that genetic effects and free radical damage - both disease risks over time - are the most common, cautionary findings. Device-crowded spaces, such as our peak commuter trains or all-wireless classrooms, may be creating a subtly toxic environment.

Wide-ranging, oxidative harm to animals has been found from Wi-Fi sources. And linked pre-diabetic and pre-cancerous changes. Ground-breaking work by biochemistry professor Martin Pall, Washington State University - winner of eight international awards - reveals a viable mechanism for such harm. But as with other 'inconvenient truths', it is going unheard.

Life's exquisite electro-physiology is still being discovered. Researchers at Bristol University reported in May that bees' hairs are highly sensitive to flowers' delicate EMFs. In controlled trials in Switzerland, bees reacted to mobile-phone signals with high-pitched 'piping': a cue to desert a hive.

Other studies show that mitochondria, the tiny power houses in our cells, are at risk from our new EMFs. And that even DNA, in its delicate antenna-like structure, may be frequency-sensitive.

The long-term, ecological implications of our new, anthropogenic radiation are not known. But peer-reviewed studies revealing harm to birds, tadpoles, trees, other plants, insects, rodents and livestock, offer clues.

Biology professor Lukas Margaritis, at Athens University, for example, uncovered harm to fruit flies from just a few minutes' exposure to our everyday wireless devices, including cordless phones, Bluetooth, and even digital baby monitors. Reviewing research, India's Ministry of Environment and Forests warned that sensitive habitats may need some protection.

The UK's Digital Economy Bill, about to receive its final seal, has sensible proposals for increasing country-wide access to fibre broadband: a technology that does not, in itself, stoke microwave pollution, though wireless add-ons do so. But probe beyond the bill to Ofcom's 5G consultations, and new EMF exposures emerge: part of global trend.

The worldwide rush towards 5G or 'fifth generation' wireless rollouts is set to raise our pulsing pollution to new levels. Untested, high microwave frequencies are being lined up to increase bandwidth, automation, and usage - at great profit to the industry.

These millimetre and centimetre waves, though too weak to heat us, may pose possible risks to our skin, and deeper surface tissue, including that of plants. High-density transmitters are envisaged. A troubling prospect for the many hundreds of patients seen by professor Dominique Belpomme's clinic in Paris: patients whose disabling symptoms from wireless technologies are supported by new brain scans and blood tests.

A delegation of scientists have petitioned for such electrosensitivity to be recognised as an environmentally-induced illness, with an International Disease Code (2015).

Pushing for fast rollouts, the wireless industry is also in conflict with the Internatonal EMF Scientists' Appeal to the United Nations. Signed by 223 scientists from 41 nations, it calls for remedial action - such as new safety limits, wave-free zones, and education of doctors - to protect our DNA, fertility, and nervous systems, plus children and pregnant women, from growing wireless exposure. And from rising, mains-electricity fields.

Signs that such caution may be needed are growing. The pulsed, polarized, microwaves used by wireless technologies pose more biological risks than smooth or natural waves. Weak millimetre waves have a known potential to increase antibiotic resistance: what ecological effects might they risk, perhaps, if used universally?

Studies also reveal a risk to skin pain receptors. Published associations between radio-masts and skin cancers, though at lower frequencies, plus mobile-phone masts and EMF-sensitive cancers (Adilza Dode, Minas Gerais University 2013), raise further questions.

In his summer press conference, Tom Wheeler - former head of the CTIA, the vast telecoms lobby-group, and controversial chair of the Federal Communications Commission - proposed unbridled *"massive deployment"* of commercial 5G transmitters, taking off in 2020.

Anticipating *"tens of billions of dollars"* of economic growth, with US telecoms *"first out of the gate"*, he warned *"Stay out of the way of technological development! Turning innovation loose is far preferable to expecting ... regulators to define the future".*

With no mention of health-testing, carbon costs, or corporate responsibility, the FCC voted unaminously to go ahead by releasing swathes of untested high frequencies for private sector exploitation - so setting a trend. To questionable ends: added to other issues, how will our communities

be affected by addiction to 5G multi-stream videos? How will it impact our spiritual communion with Nature?

Many American health activists, and cautioning scientists, are aghast. Dr Joel Moskowitz, director of community health studies at the University of California, warns *"precaution is warranted before 5G is unleashed on the world"*.

Former government physicist Dr Ron Powell points out the plans *"would irradiate everyone, including the most vulnerable to harm from radiofrequency radiation: pregnant women, unborn children, young children...the elderly, the disabled, and the chronically ill... It would set a goal of irradiating all environments".*

This drive to mine the electromagnetic spectrum come-what-may has echoes of fracking, and other headlong trends. In *Captured Agency*, the Harvard ethics report on the FCC, and the wider wireless industry, Norm Alster exposes ruthless *"hardball tactics"*, supported by *"armies of lawyers"*, at expense to our health.

Microwaves, Science and Lies (2014), filmed by Jean Hêches across Europe, exposes similar patterns that are driving our pulsed radiation to risky levels. Western "safety limits", based only on high levels that heat tissue, far exceed those of Russia, China, and some other nations.

Professor Yuri Grigoriev, long-serving chair of Russia's non-ionising radiation protection body (RNCNIRP), warned the UK's Radiation Research Trust *"ionising radiation is monitored...[but] levels of non-ionising radiation are constantly increasing and ubiquitous: it is out of control ... Urgent action is needed"*.

Stealthy pollution-raisers, such as the 5G Internet of Things - with 30 billion tiny transmitters forecast for 2020 - and also, sadly, wireless smart-meters [1, 2*], vetoed by the American Academy of Environmental Medicine, may run counter to a cherished Green goal: that of nurturing healthy environments.

Can we manage our energy, perhaps, in more bio-sensitive ways? Court claims for wireless-meter health harm, supported by medical testimonies - including by neurology professor Andrew Marino (Louisiana) - are sweeping America. Professor Pall explains such meters' *"high intensity"* microwave pulses may be more toxic than we realise: *"We know from the nanosecond studies these can be very damaging".*

Data obtained by a judge revealed all-hour, house-piercing pulses every few seconds. New data-over-wiring innovations (if free of "dirty electricity") may offer inspiring, alternative ways forward.

To create - in Wheeler's phrase - a global '5G ecosystem' of wireless super-saturated environments, at insidious risk, over time, to *living* ecosystems, not least our own bodies, is dysfunctional. And spiritually disturbing. It suggests a mindset deeply at odds with the orchid-like beauty of the Earth.

But cleaner innovations, such as LiFi, 'eco-dect-plus' phones, and the latest fibre-optics, suggest a wiser course. A new paradigm - safer connectivity, plus more balanced use - is emerging. And reminds of other step-changes in awareness. From pesticides to organic, from smoke-filled to smoke-free.

We can accede, if we wish, to our rising, planetary smog. To safety limits as high as the moon, in many scientists' eyes. And to wireless rollouts' growing carbon costs. Or taking pause, we may begin to call the industry to account - plus governments lulled by it.

We may air helpful new findings, such as risks from tablet-like exposures (Alexander Lerchl, Jacob Bremens University, 2015). And stark risks from passive exposure, bared by Leif Salford, medical professor at Lund University. We may defend DNA, if we wish, from ionizing and published non-ionizing risks, just as we defend our planet.

http://www.theecologist.org/News/news_analysis/2988266/wireless_pollution_out_of_control_as_corporate_race_for_5g_gears_up.html

A 5G Wireless Future

It would greatly extend FCC's current policy of the mandatory irradiation of the public without adequate prior study of the potential health impact and assurance of safety. It would irradiate everyone, including the most vulnerable to harm from radiofrequency radiation: pregnant women, unborn children, young children, teenagers, men of reproductive age, the elderly, the disabled, and the chronically ill."

—Ronald Powell, PhD, Letter to FCC on 5G expansion

The use of mobile wireless technologies continues to increase worldwide. A new faster 5th generation (5G) telecommunication system has recently been approved by the Federal Communications Commission(FCC) with new antennas already being installed and tested in Palo Alto and Mountain View. While it may give us uber automation and instantaneous "immersive entertainment" a lot of questions remain with regards to public health and safety of wireless devices. Will the adoption of this new 5G technology harm directly or indirectly the consumers and businesses it hopes to attract?

5G is the new promised land for wireless technology. It could connect us in our homes, workplaces and city streets to over a trillion objects around the world. (96) The Internet of Things (IoT) is primed to give us self-driving cars, appliances that can order their own laundry soap, automation hubs that pay your bills, not to mention fast movie downloads and virtual reality streaming from anywhere when you are on the go. Companies are already asking local cities and counties to move forward to create "Smart Cities" which have comprehensive digital connectivity by installing a massive wireless sensor network of almost invisible small cell antennae on light posts, utility poles, homes and businesses throughout neighborhoods and towns in order to integrate IoT with IT. They state it will improve services, the economy and quality of life. This communication network will form an expanded electromagnetic microwave blanket above each city and county, permeating the airspace and providing seamless connectivity where people and things will exchange data. Former Federal Communications Commission (FCC) chair Tom Wheeler called this a "National Priority" and thus ushered in approval for the addition of this new pervasive network of high frequency short wave millimeter broadband for commercial use first planned in urban areas.

Engineers and physicists are busy working out the details of carrier frequencies and the architecture of the new network. Manufacturing industries are already developing commonly used products that feature wireless integration that will connect to the densely clustered antennas. Marketing companies are now pushing ads for "smart" devices for "smart" people in "smart" cities. Even the healthcare industry is anticipating using some of these wearable devices for patients with cardiac conditions or to do remote surgery in other parts of the world. Opening up 5G Spectrum access hopes to drive an explosion of new products. The economic opportunities are obvious and business will be booming in the tech industry.

Concerns continue to rise however about the basic safety of our current use of wireless technologies not to mention adding layers of newer microwave frequencies that have not been tested for short term or long term safety. Important questions have not been addressed while industry and government policy have already moved forward.

- Why is the FCC streamlining permitting of 5G high frequency when they have not completed their investigation on health effects nor updated safety limits for low-intensity radio frequency radiation?

- Is the widespread "deployment" of this pervasive higher frequency small cell distributed antennae system in our cities and on our homes safe for humans and the environment?
- Will it add to the burden of chronic disease that costs our nation over a trillion dollars annually? (105) Are we already digitally over connected, outsourcing our grey matter and becoming a dysfunctional addicted nation because of it?
- How will this affect our privacy, cyber security and the security of medical records?
- Will we as physicians be able to recognize the emerging adverse health effects of new millimeter technology and wearable technology let alone that of current wireless devices?

Letters to the FCC in 2016 responding to the 5G roll out with the addition of new high frequencies were mixed. Industry generally applauded the FCC for its efforts and discussed the growing demand for this technology along with a need for flexible regulation to implement it. Some expressed concerns about interference with other satellite systems. Some felt there should be maximum spectrum usage opening up even higher frequencies that are only experimental now in order to help "the underserved". Others argued about opening this up to licensed versus unlicensed uses. Industry did not mention any potential public or environmental health hazards regarding the use of these new frequencies.

Private citizens and Phd's, however did raise a red flag at the FCC, recommending a halt to infrastructure plans and more testing for health and environmental reasons. They questioned the current FCC standards which are outdated and not protective of human health. They asked "How will it affect children, pregnant women and the elderly who are the most vulnerable in our population?" While scientists gave ample evidence that precaution should prevail, I found the most compelling letters were from those who describe their fear as electro-sensitive people in an already dangerously high electromagnetic environment for them.

Linda K., a Michigan resident, explained how she became increasingly sensitive to EMF after a cell tower was placed within 1000 feet of her house. She experienced insomnia at first and did not know there was a cell tower until several years later when she then associated the timing of its placement with her symptoms. After smart meters were installed in her area (but not on her house) she became sensitive to her laptop on wireless and her cell phone. Comcast then placed a Wi-Fi hotspot within 400 feet of her house and she stated her symptoms increased to the point that if she was outside in her yard more than 20 minutes she developed increasing fatigue, headaches, heart palpitations and high pitched ringing in her ears. These are all reported effects in those sensitive to EMF from wireless devices. She wrote about her concerns and that the new frequencies may add to her symptoms and inability to leave her house.

In another letter Veronica Z. noted "This is a notice of survival. What many of us deal with currently is trying to survive in an environment that is hostile to us biologically. We have lost all of our rights, our finances, our homes, our ability to earn a living due to this ubiquitous exposure. We are being tortured every second of every day and have been reduced to simply trying to survive the moments we are alive. Others have been unable to do so and have opted to not stay living on this planet of torture...There is no escape for people with severe sensitivities to this deadly radiation."

Are these people telling the truth? Is this just psychological? You may wonder, however, more and more people from all ages, professions and walks of life are relating similar symptoms in the presence of wireless devices. Some children reported these symptoms when their school adopted WiFi. Dr. Scott

Eberle, a well respected Petaluma hospice physician, eloquently described his development of electro-sensitivity in the November 2016 issue of the SCCMA Bulletin. He goes to great lengths to continue his profession, interact with his collegues and maintain a healthy existence. (67) We are exposed to increasing levels of microwave EMF in our daily lives. More scientific evidence links biologic effects with increased reports of health related effects including electrosensitivity. In 1971 Russian scientists Gordon and Sadchikova from the Institute of Labor Hygiene and Occupational Diseases described a comprehensive series of symptoms which they called 'microwave sickness" and presented this at an international WHO meeting. (109) In a 1981 NASA report, "Electromagnetic Field Interactions: Observed Effects and Theories" microwave sickness was also described. The symptoms recorded were headaches, eyestrain, fatigue, dizziness, disturbed sleep at night, sleepiness in daytime, moodiness, irritability, unsociability, hypochondriac reactions, feelings of fear, nervous tension, mental depression, memory impairment, pulling sensation in the scalp and brow, loss of hair, pain in muscles and heart region, breathing difficulties, increased perspiration of extremities.

Belpomme, in 2015, completed the most comprehensive study of electrosensitivity, investigating 1216 people: 71.6% with EHS, 7.2% with CS, and 21.2% with both. They found an elevation in several reliable disease biomarkers—each occurring within a range of 23% to 40% of all cases— which prompted their conclusion that these sensitivities can be objectively characterized and diagnosed and "appear to involve inflammation-related hyper-histaminemia, oxidative stress, autoimmune response, capsulothalamic hypoperfusion and pathologic leakage of the blood-brain barrier, and a deficit in melatonin metabolic availability"

The scientific literature abounds with evidence of non-thermal cellular damage from non-ionizing wireless radiation for several decades. There are likely several mechanisms both direct and indirect. Oxidative damage is one that has been well studied. Effects have been demonstrated on cell membranes causing a shift in the voltage gated calcium channels. Sperm studies have consistently found genotoxic, morphologic and motility abnormalities in the presence of cell phone radiation. DNA damage, blood brain barrier effects, melatonin reduction, nerve cell damage, mitochondrial disruption and memory disturbances have been revealed. The Bioinitiative Report (139) has chronicled these effects and a growing wave of PEER reviewed studies is building on that base daily. In 2011, the International Agency for Research on Cancer classified radiofrequency as 2B carcinogen and "possibly carcinogenic to humans", the same category as DDT, lead and other pesticides.

The most recent and compelling evidence has come from the 2016 National Institutes of Health, National Toxicology Program. Called the NTP Toxicology and Carcinogenicity Cell Phone Radiation Study, the 10 year $25 million research revealed conclusively that there was a harmful effect from cell phone microwave radiation. (124,125) The frequencies are similar to other wireless devices we commonly use. The studies were robust, collaborative, well controlled and with double the number of rats required to reveal a significant effect, if present. The preliminary results of the study showed that RFR caused a statistically significant increase in two types of brain tumors, gliomas and schwannomas. These were the same two types of tumors shown to increase in human epidemiological studies on long term use of cell phones. Dr. Lennart Hardell and others have demonstrated a consistent pattern of increased incidence of ipsilateral (same side) acoustic neuromas (vestibular schwannomas) and gliomas with each 100 hours of cell phone use. (112-118) Another telling finding was that the control rats had much lower than expected cancer rates. It is believed due to the fact the control rats were in a controlled faraday cage and not exposed to normal ambient EMF that could contribute to cancer.

Ron Melnik, PhD, Senior Toxicologist and Director of Special Programs in the Environmental Toxicology Program at the National Institute of Environmental Health Sciences (NIEHS) and designer of the study states, “The NTP tested the hypothesis that cell phone radiation could not cause health effects and that hypothesis has now been disproved. The experiment has been done and, after extensive reviews, the consensus is that there was a carcinogenic effect.”

The term "millimeter waves" (MMW) refers to extremely highfrequency (30-300 GHz) electromagnetic radiation. Millimeter Waves (MMW) used in the next-generation of high-speed wireless technologies have shallow penetration thus effect the skin surface, the surface of the eye or on bacteria, plants and small life forms. Surface effects, however, can be quite substantial on an organism as stimulation of skin receptors can affect nerve signaling causing a whole body response with physiological effects on heart rate, heart rhythm, and the immune system. In a 1998 review article, Pakhomov (123) looked at the bio-effects of millimeter waves. He reviewed dozens of studies and cites research demonstrating profound effects of MMW on all biological systems including cells, bacteria, yeast, animals and humans. Some effects were clearly thermal as millimeter microwaves are rapidly absorbed by water which is abundant in living organisms. When microwaves are absorbed the energy can cause tissue heating. Many of the millimeter frequency studies however showed effects without heating of tissues and at low intensities. Research was variable and showed both regenerative effects and also adverse effects depending on frequency, power and exposure time.

Chernyakov induced heart rate changes in anesthetized frogs by microwave irradiation of remote skin areas. Complete denervation of the heart did not prevent the reaction. This suggested a reflex mechanism of the MMW action involving certain peripheral receptors.

Potekhina found certain frequencies from 53-78 GHz band (CW) changed the natural heart rate variability in anesthetized rats. He showed that some frequencies had no effect (61 or 75 GHz) while other frequencies (55 and 73 GHz) caused pronounced arrhythmia. There was no change in skin or whole body temperature.

One study of MMW teratogenic effects was performed in Drosophila flies by Belyaev. Embryos were exposed to 3 different GHz frequencies for 4-4.5 hours at 0.1 mW/cm^2. He found that irradiation at 46.35 GHz, but not at 46.42 or 46.50 GHz, caused marked effects including an increase in morphological abnormalities and decreased survival. It was felt the MMW disturbed DNA-protein interactions at that particular frequency.

Bulgakova in over 1,000 studies with 14 different antibiotics showed how MMW exposure of S. aureus affects its sensitivity to antibiotics with different mechanisms of action. The MMW increased or decreased antibiotic sensitivity depending on the antibiotic concentration. (134) Pakhomov warns, “Regardless of the primary mechanism, the possibility of significant bio-effects of a short-term MMW irradiation at intensities at or below current safety standards deserves consideration and further study. The possibility of induction of adverse health effects by a local, low-intensity MMW irradiation is of potential significance for setting health and safety standards and requires special attention.” He called for replication of studies especially long term effects of MMW.

Prost in 1994 studied millimeter microwave radiation on the eye. He noted that microwaves of different wave-lengths can induce the development of cataracts. (13) His research found that low power

millimeter waves produced lens opacity in rats exposed to 10mW/cm^2, a predisposing indicator of cataracts.

Kolomytseva, in 2002, looked at the dynamics of leukocyte number and functional activity of peripheral blood neutrophils under whole-body exposure of healthy mice to low-intensity extremely-high-frequency electromagnetic radiation (EHF EMR, 42.0 GHz, 0.15 mW/cm^2, 20 min daily). The study showed that the phagocytic activity of peripheral blood neutrophils was suppressed by about 50% in 2-3 h after a single exposure to EHF EMR.

Gapeve in 2003 showed for the first time that low-intensity extremely high-frequency MMH electromagnetic radiation in vivo causes effects on spatial organization of chromatin in cells of lymphoid organs. Chromatin is a complex of DNA and proteins that forms chromosomes within the nucleus of eukaryotic cells. He exposed mice to a single whole-body exposure for 20 min at 42.0 GHz and 0.15 mW/cm^2.

Habauzit in 2013 looked at gene expression in keratinocytes with 60GHz exposure at upper limit of current guidelines and concluded “In our experimental design, the high number of modified genes (665) shows that the ICNIRP current limit is probably too permissive to prevent biological response.

Commercial production often precedes research on consumer protection and health effects. We have too many toxins that have escaped premarket safety protocols for too long—lead, asbestos, smoking and our modern unregulated nanoparticles to mention just a few. These affect our long term and short term health in ways we do not even know. If we become ill, we do not question or identify the daily or weekly chemical exposures that could have contributed to that cancer or arthritis or lung disease or Alzheimer’s. We have too many toxins to sort it all out. Research shows that wireless microwave radiation adds yet another dose of toxic exposure to our daily lives. We cannot hear it or smell it or feel it. Yet it affects our biology and our wellbeing with perhaps subtle affects. If we are electro-sensitive then we are more likely to avoid exposure. Trees are even susceptible to EMF harm and they cannot move away. (128) What about birds and bees and us?

If we are concerned about putting a cell phone to our ears for long periods of time after reading about the NTP study then why aren’t we concerned about other wearable devices? While very cool to use Google Glass and Virtual Reality may have dangerous consequences to our eyes, brain function or immune systems with long term use, especially to children. What are the frequencies in these devices? 3G, 4G, 5G or a combination of zapping frequencies giving us immersive connection and entertainment but at a potentially steep price.

Safety testing for 5G is the same as other wireless devices. It is based on heat. This is an obsolete standard and not considering current science showing cellular and organism harm from non-thermal effects. There is a large gap in safety data for 5G biological effects that has been demonstrated in older studies including military.

https://wirelessaction.files.wordpress.com/2016/09/5g-wireless-future-sccma-bulletin_feb-2017.pdf

Medical Director of Switzerland's Paracelsus Clinic Takes Stand on Hazards of Electromagnetic Pollution 'Electromagnetic Load' a Hidden Factor in Many Illnesses

Dr. Thomas Rau, Medical Director of the world renowned Paracelsus Clinic in Lustmühle, Switzerland says he is convinced 'electromagnetic loads' lead to cancer, concentration problems, ADD, tinnitus, migraines, insomnia, arrhythmia, Parkinson's and even back pain. At Paracelsus (www.paracelsus.ch), cancer patients are now routinely educated in electromagnetic field remediation strategies and inspectors from the Geopathological Institute of Switzerland are sent to patients' homes to assess electromagnetic field exposures.

Of note, Dr. Rau says a strategy to consider for those experiencing 'electrical sensitivity' symptoms is to remove the electromagnetic 'hot spot' in the head created by the presence of metal fillings. Concern is thus not only for the 'neurotoxic' aspect of mercury in fillings, an increasingly understood hazard, but because fillings themselves act as antennas in the presence of electromagnetic fields from cell phones and cell towers, wi-fi networks, portable phones, and other sources of radiofrequency radiation.

Rau says the removal of dental fillings can be an important early step in reducing electrical sensitivity, allowing some people to live in homes they otherwise could not tolerate.

Cultures have shown beneficial bacteria grows more slowly in the presence of electromagnetic fields, says Rau, allowing pathological organisms to dominate. Thus, a strategy with electrically sensitive patients, or with those facing chronic conditions, is the aggressive supplementation with probiotics and other Biological Medicine approaches to balance intestinal flora. Many people with chronic infections likely linked to EMF exposures, such as Lyme Disease, are symptom- free after an aggressive microorganism rebalancing program.

Electrical sensitivity—originally known as radio wave sickness—is a sometimes debilitating experience created by these and other disregulating effects of electromagnetic fields. Linked to many acute and chronic illness conditions, electrical sensitivity is a serious emerging public health issue globally and a subject in which most doctors have no training.

A Petition to Congress, created by www.ElectromagneticHealth.org is now circulating on the internet, requesting Congress 1) mandate the FCC lower exposure guidelines to reflect the large body of science showing biological effects at exposures much lower than current standards, 2) repeal Section 704 of the Telecommunications Act of 1996, which rescinded state and local governments right to resist towers on health or environmental grounds, 3) stop the roll out of the Wi-Max network until Congress better understands the potential health consequences, and 4) accommodate citizens unable to function adequately in high EMF environments, including forbidding cell towers on school properties.

Rau says exposing children in schools to radiation, known to impair brain function and learning, is "criminal". He says, "It is unethical to expose children to electromagnetic load in this way. We know that power stations for electromagnetic waves like mobile phones are hurting the brains of children, so to put such stations into schools is really…very, very bad. Dr. Rau says, the question is, "Does the school, or does the society, really want to have intelligent, well-educated children, or not?" He says, "If you install mobile phone towers, which radiate to the children, their intelligence, their brain capacity, decreases.

You will have more ADD children, you will have less function of the brain, which in the long term reflects on the intelligence of the children, of the possibility to really teach children, and in the long term, the more this overcomes society, the more we will have dumb children."

The reality of the health consequences of electromagnetic radiation eventually will have to be faced, and this will only happen with active pressure on Congress. It is estimated that 3-8% of populations in developed countries experience serious electrohypersensitivity symptoms today, and 35% experience mild symptoms. With increasing electromagnetic field exposures, these numbers, along with the suffering involved for people who are impacted, and the health care costs involved, are bound to go up.
http://www.marioninstitute.org/electromagnetic-load-a-hidden-factor-in-many-illnesses/

How to identify and reduce electrosmog

1. What are the recommended levels for RF radiation?

Various radiofrequency (RF) radiation guideline recommendations (given as µW/m^2*):

10 000 000 µW/m^2 – FCC (USA) OET-65, recommendation
9 000 000 µW/m^2 – ICNIRP 1998; WHO, recommendation
100 000 µW/m^2 – Russia and Italy, recommendation **
1 000 µW/m^2 – the Bioinitiative Report 2007, recommendation
170 µW/m^2 – the Seletun Statement 2010, recommendation
3 µW/m^2 – the Bioinitiative Report 2012, revised recommendation *(Precautionary ceiling (top) level for 2013, may be revised at a later date)*
0.1 µW/m^2 – contribution from the sun at daytime during big solar storms

0.000 001 – 0.000 000 000 01 µW/m^2 – this is the natural background during normal cosmic activities; proposed by Olle Johansson, Karolinska Institute (1997), as a genuine hygienic safety value. Above this level we could say electrosmog pollution is present, unless in the midst of a large solar storm.

*microwatts per meter squared

** EMF World Standards Database World Map (World Health Organization)

Please note: The range 0.000001 – 0.00000000001 µW/m^2 is the true natural background level during normal cosmic activities, which is what we have evolved to tolerate, according to Dr. Olle Johansson. In developed nations, according to Dr. Johansson, these levels might only be seen in a cave or specially designed military installation. However, it is instructive to see the great distance between *what we evolved to tolerate* and the suggested guidelines above. In the USA, the FCC guidelines make it currently legal to allow RF radiation levels at 10 000 000 µW/m^2, which is 10,000,000,000,000 (ten trillion) times higher than the *upper* natural background levels we evolved to tolerate! Is it any wonder that bioeffects and health impacts would be observed under these alarming conditions?

When 1/88 children in the USA are born autistic, and RF radiation does impact the brain and neurological systems, particularly at risk are the fetus, embryo, young child and developing children through age of 20, according to scientists, it is no wonder that the BioInitiative Report 2012 (on RF radiation and bioeffects) has an entire section on Autism. It is a proven fact that we are destroying and mutating our DNA with RF radiation such as emitted from wireless toys, wireless utility meters, and cell antennas and towers. Known to inflame tissues, interfere with cellular function, and damage DNA and sperm, the exposures everyone is getting via the wireless craze is resulting in an increase in certain cancers, reproductive problems, and birth defects that may result in autism, learning disabilities, and ADHD, according to some scientists.

The FCC limit is 3,333,333 times higher than BioInitiative Limit of 3.0 µW/m^2, for sensitive populations that include children and pregnant women

An FCC Limits Primer (by StopSmartMeters.org)

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Some examples:

a. Example at a school in Encinitas CA, with 20 cellular antenna on the church property where the school leases classrooms (12 antenna in the steeple next to classrooms, and 8 in the parking lot):

The RF fields were found to vary from 200 to greater than 20,000 µW/m^2

3.0 µW/m^2 (divided by) 20,000 µW/m^2 = 6,666 times higher than the BioInitiative 2012 limit

b. Example of measurements from 3 types of smart meters using a Ten-Mars TM-195 3-Axis RF field meter.

Table 2: Hickory Creek Focus AXR mesh, frontal radiation

Distance		**Day 1**	**Day 2**
Ft	**m**	**mW/m^2**	**mW/m^2**
3	1	191	—
5	1.6	116	—
10	3.2	34	22
15	4.8	8	—
20	6.5	4	3
30	9.7	3	2
50	16.1	1	1
100	37.3	0.4	0.4

Ambient	0.6	0.02

All values are peak.

The measurements were taken in the early evening on both days and are consistent. The radiation levels reach the ambient levels at a distance of about 100 ft (32 meters) from the front of the meters.

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2. A sample of bioeffects and health impacts listed for various levels:

a. See the 2012 BioInitiative Report and the Color Charts [Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)] associated with the report for current references (December, 2012).

Examples from BioInitiative 2012 Color Charts: Note: Charts are in uW/cm^2 ; CEP has converted several to **uW/**m^2 (in parentheses) ; to convert rest of chart, multiply x 10,000 for **µW/**m^2, or *move decimal point **to right**, four places*.

0.003 – 0.02 uW/cm^2 **(30.0 – 200.0 µW/**m^2**)** In children and adolescents (8-17 yrs) short-term exposure caused headache, irritation, concentration difficulties in school. Heinrich, 2010

0.003 to 0.05 uW/cm^2 **(30.0 – 500.0 µW/**m^2**)** In children and adolescents (8-17 yrs) short-term exposure caused conduct problems in school (behavioral problems) Thomas, 2010

0.005 uW/cm^2 **(50.0 µW/**m^2**)** In adults (30-60 yrs) chronic exposure caused sleep disturbances, (but not significantly increased across the entire population) Mohler, 2010

0.005 – 0.04 uW/cm^2 **(50.0 – 400.0 µW/**m^2**)** Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated) Thomas, 2008

CEP NOTE: 0.01 uW/cm^2 **(100.0 µW/**m^2**) = 1/1000th of FCC guidelines**

0.006 – 0.01 uW/cm^2 **(60.0 – 100.0 µW/**m^2**)** Chronic exposure to base station RF (whole-body) in humans showed increased stress hormones; dopamine levels substantially decreased; higher levels of adrenaline and nor-adrenaline; dose-response seen; produced chronic physiological stress in cells even after 1.5 years. Buchner, 2012

CEP NOTE: 1000 uW/cm^2 **(10 000 000 µW/**m^2**)** – FCC (USA) OET-65, recommendation **- "FCC Guideline", 6-minute occupational exposure and 30 minute public exposure based on heating**

b. According to Firstenberg, presented (2007) in an amended table by M. Havas, PhD of scientific findings to include FCC guideline info : At 1/100th of FCC guidelines: sleep disorders, abnormal blood pressure, nervousness, weakness, fatigue, limb pain, joint pain, digestive problems, learning problems

(fewer schoolchildren promoted). **At 1/1000th of FCC guidelines:** altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels. structural changes in liver, spleen, testes, and brain, slowing of the heart, increase in melatonin, decreased cell growth, increased sterility, childhood leukemia, impaired motor function, reaction time, memory and attention of school children, and altered sex ratio of children (fewer boys); cardiac arrythmias and sometimes cardiac arrest (frogs); altered white blood cell activity in schoolchildren, headache, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion (humans – occupational exposure); **1% of FCC guideline**: damaged mitochondria, nucleus of cells in hippocampus of brain, impaired memory and visual reaction time, redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood. (5)

Note: Firstenberg / Havas table below is in **µW/c**m^2 - multiply x 10,000 for **µW/**m^2 **(provided in parentheses)**, or move decimal point **to right** four places.

Power Density in µW/cm^2 **(µW/**m^2**) – Reported Biological Effects – References**
0.0000000000001 Altered genetic structure in E. Coli Belyaev 1996
0.0000000001 (.000001 µW/m^2**) Threshold of human sensitivity Kositsky 2001**
0.000000001 (.00001 µW/m^2**) Altered EEG in human subjects Bise 1978**
0.0000000027 Growth stimulation in Vicius fabus Brauer 1950
0.00000001 Effects on immune system in mice Bundyuk 1994
0.00000002 Stimulation of ovulation in chickens Kondra 1970
0.000005 Effect on cell growth in yeast Grundler 1992
0.00001 1/100 millionth of FCC guidelines
0.00001 Conditioned "avoidance" reflex in rats Kositsky 2001
0.000027 Premature aging of pine needles Selga 1996
0.002 (20.0 µW/m^2**) Sleep disorders, abnormal blood pressure, nervousness, weakness, fatigue, limb pain, joint pain, digestive problems, fewer schoolchildren promoted Altpeter 1995, 1997**
0.0027 Growth inhibition in Vicius fabus Brauer 1950
0.0027 to 0.065 Smaller tree growth rings Balodis 1996
0.01 1/1000th of FCC guidelines
0.01 (100 µW/m^2**) Human sensation Kolbun 1987**
0.06 Altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels, structural changes in liver, spleen, testes, and brain—in white rats and rabbits Dumanskij 1974
0.06 (600 µW/m^2**) Slowing of the heart, change in EEG in rabbits Serkyuk, Reported in McRee 1980**
0.1 Increase in melatonin in cows Stark 1997
0.1 to 1.8 Decreased life span, impaired reproduction, structural and developmental abnormalities in duckweed plants Magone 1996
0.13 Decreased cell growth (human epithelial amnion cells) Kwee 1997
0.168 **(1680.0 µW/**m^2**)** Irreversible sterility in mice Magras 1997
0.2 (2000.0 µW/m^2**) to 8.0 Childhood leukemia near transmitters Hocking 1996**
0.3 (3000.0 µW/m^2**) Impaired motor function, reaction time, memory and attention of schoolchildren, and altered sex ratio of children (fewer boys) Kolodynski 1996**
0.6 Change in calcium ion efflux from brain tissue Dutta 1986
0.6 **(6,000.0 µW/**m^2**)** Cardiac arrhythmias and sometimes cardiac arrest (frogs) Frey 1968

4 **(40,000.0 µW/**m^2**) Altered white blood cell activity in schoolchildren Chiang 1989**
1 (10,000.0 µW/m^2**) Headache, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion (humans—occupational exposure) Simonenko 1998**
1 Stimulation of white cells in guinea pigs Shandala 1978
1 Within 16 feet (5 meters) of a Wi-Fi node in San Francisco Maifeld 2007
2 "Microwave hearing"—clicking, buzzing, chirping, hissing, or high-pitched
tones Frey 1963, 1969, 1971, 1973, 1988, Justeson 1979, Olsen 1980, Wieske 1963, Lin 1978
2.5 (25,000.0 µW/m^2**)Breakdown of blood-brain barrier (used a digital cellular phone to provide the radiation) Salford 1997**
5 **(50,000.0 µW/**m^2**)**Leukemia, skin melanoma and bladder cancer near TV and FM transmitter Dolk 1997
5 **(50,000.0 µW/**m^2**)** Biochemical and histological changes in liver, heart, kidney, and brain tissue Belokrinitskiy l982
10 1% of FCC guideline
10 **(100,000.0 µW/**m^2**)**Damaged mitochondria, nucleus of cells in hippocampus of brain Belokrinitskiy 1982a
10 **(100,000.0 µW/**m^2**)** Impaired memory and visual reaction time in people living near transmitters Chiang 1989
10 **(100,000.0 µW/**m^2**)**Decreased size of litter, increased number of stillborns in mice Il'Chevich (reported in McRee
1980)
10 **(100,000.0 µW/**m^2**)**Redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood
Shutenko 1981
1000 FCC Guideline, 6-minute occupational exposure and 30 minute public exposure based on heating

3. Practical suggestions to reduce electrosmog, based on current science cited in the BioInitiative Report 2012:

The following may seem difficult to achieve in today's world (2013) but we can assure you that it is possible to take control of your environment and greatly reduce your (and your loved ones') exposure to electrosmog by applying the following suggestions.

When you consider that only 1-2 decades ago, none of the wireless and RF-emitting technologies so popular today were in use, you can realize that these are not necessary for living, and in fact, are increasingly implicated in shorter lifespans (cancer, heart); debilitating illness (headaches, coronary problems, immune disorders, neurological problems and more); and suspected to cause birth defects. **It is worth it to reduce electrosmog pollution in your own personal environments!** Here's how:

CEP recommends that wireless devices be removed from homes and communities. wired internet, corded phones, no wireless or wired utility "smart" or PLC meters (opt-out if available, avoid installation or close proximity, if no opt-out). Be aware that second-hand RF radiation from others' cell phones, Wi-Fi, and smart meters does produce measurable levels that are of concern. Avoid if possible.

How to protect yourself against smart meters (article)

CEP recommends ridding the home, vehicle, school, and workplace of RF radiation sources such as smart meters, Wi-Fi, wireless baby monitors, wireless security systems, cell phones, DECT phones and others that are cordless, Bluetooth and other similar wireless technologies including headsets, wireless tv, wireless appliances, appliances with wireless built-in to communicate with the smart meters (HAN appliances, which can be distinguished by the FCC ID code on the equipment), wireless security systems, turn off the wireless feature on computers, laptops, notebooks, etc. in the Control panel, no wireless printers, wireless reading devices, and all wireless devices not on this list.

Cell phones should not be used in cars, or during public transportation, as the signal has a harder time getting out and the phone produces more RF radiation as it ramps up to find a signal.

Pregnant mothers should NOT use cell or cordless phones nor be in Wi-Fi environments. All of the above should be removed from the home and other occupied spaces during pregnancy.

Children should NOT be given cell phones of their own, nor adults' cell phones to entertain them. They should not be exposed to adult cell phone use in the home nor in vehicles. Children should not be given wireless laptops, tablets, notebooks, or reading devices to use on a regular basis. If some of these are to be used occasionally, they should be shielded and wired. Phones in the home should be wired.

Cellphones should not be carried in "on" position in pockets (this includes airplane mode). Laptop computers should not be used on laps. Scientists have confirmed that RF radiation from laptops and cell phones can damage sperm and reproductive systems may be interfered with, that the sperm, female reproductive system, developing embryo, and fetus are very sensitive to RF radiation and are at grave risk of damage that may lead to miscarriage and/or birth defects. Cell phones, if these must be used, should be used in speaker mode, at several feet from body, and only rarely. Studies have shown bioeffects at arm's length.

If laptops are used, place on a table, 2-3 feet from the body, with extended (additional) wired keyboard (low RF if possible) and extended, wired low RF mouse, and additionally, may wish to obtain shielding material for the base of the keyboard. Testing with a RF field meter to determine levels is recommended.

Avoid close proximity to cell towers and cellular antenna. www.antennasearch.com has locations of many (not all) cellular antenna/towers. **ALERT**: **find out if your child's school or your church has hidden or visible cellular antenna or cell towers on the property**, that can be sources of high levels of RF radiation. Sadly, many schools and churches are allowing telecom companies to lease space to install these cellular facilities, which are promoted as "safe' because they are legal and meet the very exceedingly obsolete FCC guidelines, based only on the heating of tissues in a large male.

When purchasing a vehicle, be aware that newer vehicles may have high RF exposures – wireless features built-in, as well as many computerized systems that may be a source of RF radiation. Hybrid and electric vehicles may have increased RF radiation exposures due to charged batteries in close proximity to driver and passengers.

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4. Measure and monitor your environments for RF radiation - before and after you implement the above suggestions

Please note: CEP does *not* sell any of these products. These are offered only as examples of items that may help you identify, reduce, and avoid RF radiation. They may be obtained through some of the websites links below, or obtained through eBay, Amazon, or other outlets. Stop Smart Meters offers the Cornet meters, including the latest version.

CEP recommends measuring the RF radiation in your vehicle, home, church [may have cell antenna in steeple or on property] school [may have cell antenna on property and/or Wi-Fi] and workplace [Wi-Fi, wireless security system] with a sensitive RF (radiation) field meter that measures in **either µW/**m^2 **or µW/c**m^2 **up to at least 6 GHz**, necessary for testing the new Wi-Fi frequencies, up to 5.6 GHz. **Simple to use, inexpensive but reliable rf field meters are the:**

Cornet ED 78S RF/LF Electrosmog Meter (used only)

Cornet ED88T Tri-Mode (RF/LF/ E-Field) Electrosmog Meter (new version)

These small-sized, convenient, less expensive meters measure in mW/m^2 and have a Peak/Max hold (so you can view how high the pulses get to). The BioInitiative Report 2012 recommends a precautionary level of 3.0 microwatts per meter squared (0.0003 microwatts per centimeter squared) which is equal to 0.003 milliwatts per meter squared. Of note, the Cornet meters above come with a scale of "safe-caution-danger" zones that do not correspond to the latest scientific data, and are generally higher than what is recommended by BioInitiative 2012. So comparing the measurements obtained with 0.003 milliwatts per meter squared is a better way to determine the level of risk if using the Cornet meters. On the Cornet meter used by this writer, a label has been placed, with 0.0003 mW/m^2 on the front, to compare readings to.

http://www.electrosmogprevention.org/smart-meter-resources-links/safety-guidelines-for-rf-exposure/

Another Inconvenient Truth

February 8th, 2017

On May 26 of last year cell phone use was directly linked to cancer. Our Government's National Toxicology Program (NTP), part of the National Institute of Health, released a preliminary report stating, "Two types of cancer were caused by heavy cell phone use, glioma brain tumors and heart schwanomas." They were surprised because this study, initiated by the Food and Drug Administration, was to show cell phone use did not cause cancer. The NTP came out with these findings so agencies that protect your health and safety could take appropriate measure to insure public safety.

This is new and important information because you can begin taking protective measures by monitoring all wireless products and their sources that your children are using. This includes (1) Wi-Fi which is usually on 24/7 at home and you can get radiation from your neighbor's wireless use, (2) smartmeters, electric, gas and water are radiating 24/7, (3) smart appliances radiate 24/7, (4) students have Wi-Fi in their classroom, radiating 6 hours a day 5 days a week, (5) students also have computers in their classrooms and for homework, radiating 4 to 6 hours per day, (6) gaming, social media, watching TV programs, movies and sporting events on their cellphones, tablets and computers - radiating them another 2 to 6 hours a day, (7) many neighborhoods have cell phone antenna towers radiating 24/7, within different zones: the deadly zone 150 meter (492') radius from the tower, the dark zone 500 meter (1640') radius, and there are some adverse effects as far out as 1000 meters, (8) many children have 4G phones which they usually carry next to their bodies and on night stands, radiating them continuously while it's in their possession, which is contrary to most manufacturer's safe usage guidelines, (9) printers, faxes, baby monitors and headsets, (10) remote controlled: toys, TV's, stereos, keys, lights, fans, switches, alarm systems, and (11) all the other wireless devices you have and are going to buy in the future.

Radiation exposure is accumulative, and when you add up all the exposure your child is getting it gets scary. Microwave radiation penetrates deeper within smaller bodies. The earlier children are exposed to heavy radiation the sooner the clock starts ticking for higher risk of getting cancer and other adverse health conditions from radiation. If you start exposing young children early they could be at high risk before they graduate from high school or college.

Studies by independent scientists have connected wireless radiation to cancer and a multitude of adverse health conditions. In 2011 the World Health Organization listed cell phone radiation a Possible Carcinogen. In 2012 an Italian Supreme court ruling said, "Brain cancer was connected to heavy cell phone use." On February 27, 2016 an Italian study linked cell phone radiation to cancer and now the above study linking cell phone use to cancer.

After the Federal Communications Commission (FCC) received information of the NTP's rodent study, Chairman Tom Wheeler, rolled out the 5G program as a national priority and bared any questions or comment on the NTP study. 5G increases ambient cell tower radiation; 5G operates at higher frequencies that have a short range and 5G can't penetrate solid objects very well so antennas will be on practically every telephone pole. The government is not going to protect you; the telecom industry has too much influence over their protective agencies. You need to take responsibility and create safe environments for your children.

Chairman Wheeler stated, “We wanted to be the first to have 5G,” even though South Korea is ahead of them -- which is a good thing. South Korea is one of the world’s most technologically advanced countries and they are experiencing repercussions that go with advancement without safety trials and precautions. They have a budding epidemic called “digital dementia,” with children more at risk than adults because their brains are still growing. “The situation is worsening”, Korean doctor’s report, “with the percentage of people between ages 10 and 19, who use their smartphones for more than seven hours a day, leaping from 7% to 18.4% in one year.” Doctors have warned that these deficits in brain development are irreversible.

Wireless radiation causes cancer and many adverse health conditions. Protect your children and yourselves by reducing your exposure, not buying wireless products before they’re proven safe, reduce use, and eliminate the ones that are not necessary. Please, practice prudence and precaution when something is affecting your children’s health.

http://hpr1.com/index.php/lifestyles/wellness/another-inconvenient-truth/

Controversy surrounding EMF exposure: Do wireless devices pose dangers?

We're living in the age of wireless everything -- and it's being debated whether devices, such as cell phones, Wi-Fi routers and even baby monitors could be harmful to us.

"I started to get headaches and tinnitus, my ears were ringing really bad, my hair stated to fall out, I was getting acid reflux and leg cramps, and my memory was going," said Paul Harding.

In 2011, Harding says it was those symptoms he began experiencing after the utility company put a smart meter on his home. After the installation, he says he'd wake up at 3:12 a.m. every morning with a racing heart beat.

"When they put the smart meter on, the power mode switch supply inside of it is creating dirty electricity and when it sends its information, the wiring in your home is acting like an antenna so RF travels on energized wiring, so it's actually pulsing the electric field that you're absorbing," explained Harding.

Harding talked with a few neighbors who had similar symptoms and after reading a few articles, he believed he was suffering from something called Electromagnetic Radiation Sickness. He says harmful RF or radio frequencies are produced in your home by things like Wi-Fi routers, cell phones and computers.

"Well there's all sorts of devices out there that use wireless technology and there are devices, such as dimmer switches, CFL light bulbs that are producing what is called dirty electricity, so absorbing those fields that they are producing, studies have shown to cause nerve blockage."

Harding is now making it his mission to help others to get rid of what he says is unnecessary exposure to RF, AC magnetic fields, and AC electric fields in their homes, like this woman who did not want to be identified:

"It feels like a live wire inside of my body, and I don't know what it's from, like power overload or something."

Harding uses equipment to measure for dirty electricity, electrosmog and power quality.

"This is a high frequency analyzer. It measures anywhere between 2.4 and 10 gigahertz. This is also a high frequency analyzer, but it goes from 27 megahertz to 2.4 gigahertz," he said.

In a situation like this, Harding recommends painting the walls with RF electric field deflecting paint, applying special tint on the windows and unplugging the Wi-Fi.

This woman did, and after the meter is measuring .04 and is nearly silent.

Harding also recommends electricity filters and fixing mistakes in your home's wiring.

"When they're running right next to each other, it will cancel out that magnetic field. When there is a wiring error, which we see quite often with mistakes that are made when the house was put together you see very large magnetic fields."

"To put it into perspective, the sun, if you're out in Phoenix midday in June, that's over one kilowatt per square meter, so all of these things are much lower than that," explained Peter Rez, a professor in Arizona State University's physics department.

There's been a lot of controversy surrounding this topic and how much EMF exposure is safe or if it's even harmful at all.

"All of these environmental sources are very, very low and the worst possible case is the cell phone transmitting to a tower a long way away and everything else is going to be less than that," added Rez, who says there's no reason for concern.

"EMF, the main effect is heating. When you have very high power EMF as in a microwave oven, the effect is obvious, you heat up your food. However the levels of EMF from the environment from radio transmissions, from cell phones, from local wireless area networks is very, very low, it's negligible."

Although there is controversy, Harding says he's seen results and believes in what he's doing.

"We don't want to know that our precious smart phones to be, you know, we don't want to know that they could possibly be hurting us, but if you were to look on the iPhone and go from general to legal RF exposure, it will tell you to keep that phone 10 millimeters to 5 millimeters away from your body at all times."

Harding says some people are more sensitive to EMF radiation than others. He suggests getting rid of wireless devices in your home, such as keyboards, a computer mouse, and baby monitors.

By the way, it can cost thousands of dollars to have a home mitigated of EMF and that does not include Harding's services.

http://www.fox10phoenix.com/news/arizona-news/95054197-story

Are my toys playing with my DNA?

Nov 27, 2015

Last week, I got my first wearable. Before using it, I wanted to read up on it, to learn if it was safe to have on my person, 24/7. My goal was a blog about how to safely use gadgets. But I ended up learning a lot more than I expected. Let me start at the beginning.

My new $12 Mi Band is a barebones wearable from Xiaomi without even a dial to tell the time. What it does have is a motion sensor that counts my steps and monitors my sleep patterns. It also has a vibration motor as well as notification lights to communicate. I can set it to vibrate when I get a call, or receive messages, or as an alarm. The notification lights do some notifying. But decoding flashing lights is a bit too nerdy for me. The invisible cellphone unlock function is fun, and I happily buckled on the band.

My wife however didn't share my excitement. She worries about the harm that gadgets may be doing to our bodies. She's not into technology, but she's aware her ear gets warm when she talks too long on her cellphone and it begins to hurt, and she intuitively knows that can't be good.

My curiosity was tickled and I began to wonder if her worry was justified. Cellphones have become popular only in the last 10–15 years, and it may be too early to understand their effect on our bodies. So I read up about them.

What I found was an almost fictional tale of invisible rays, DNA cracking, ruthless corporates, global media manipulation, a crusading scientist whose house gets mysteriously burnt down, and more. In short, all the ingredients for a riveting Hollywood thriller.

I was more worried about my brains being cooked than cooking up a thriller. So I have stuck to my goal of a blog about safely using gadgets, though I have touched upon these stories, and given links for more details. However the blog is a bit longer than I expected. Getting at the truth was not easy with so many exposes, coverups and unverified stories.

It took nearly 50 years for the dangers of smoking to become accepted. The fact that tobacco was a huge cash generating industry with a powerful lobby may have something to do with it. But tobacco was miniscule compared to the size of the global cellphone industry, so it may be a case of deja vu.

A cellular phone is basically a radio that sends signals on electromagnetic waves (microwaves) to its network's cellular tower. The waves' effect is like a microwave oven, but weaker. It's measured as SAR (specific absorption rate), and a cellphone's legal limit is 1.6 watts/kg. Cellphones with high SAR are more damaging. The harmful effects are increased by other factors like the cellphone's signal strength, distance from your body, and time on your body. However, heating may not be where the real danger is. I'll come back to this.

All of us have first-hand stories of the effects of cellphones. Mine is about a friend who used to drive around all day with his cellphone on the car seat between his thighs and up close to his unmentionables. He ended up visiting his doctor to complain about a pain in the unsaid part. The doctor advised him to keep his cellphone away from his body, and the pain vanished.

That's when I first began to wonder if I was being too complacent about my toys. The problem is technology is so deeply interwoven with my life that it's hard to avoid close contact with my gadgets. But if I can make some sense of the online info overload, maybe I can work out some guidelines for myself.

There is a lot of conflicting info on the internet about the danger of cellphone usage. So I tried to put two and two together. Like the fact that many insurance companies no longer cover health problems caused by cellphones radiation. Besides, 60% of insurance companies are refusing to cover cellphone makers and wireless carriers against future health damage suits, and forecasting brain tumor costs between 2020 and 2030.

The alarm bells began going off in my head.

In May 2015, 190 independent scientists from 39 countries, who between them have authored more than 2,000 papers on the topic, requested the UN, WHO, and national governments to put stricter controls on cellphone phone radiation. They point to new research that suggests even the low levels of radiation from cellphones could potentially cause cancer.

One of the issues is that the cellphone industry uses SAR as a measure of a cellphone's safety. SAR only measures the heating effects of cellphone radiation. But new studies suggest that exposure to cellphone radiation can cause dangerous biological effects without any heating.

Studies have shown that the unique pulsing nature of a cellphone's electromagnetic waves causes resonance in our cells, which can break DNA strands and cause DNA to lose its ability to repair itself.

In one word, cancer.

Also since nerve cells can no longer divide and proliferate, this damage could lead to degenerative diseases such as Parkinson's and Alzheimer's… You can read more about this here.

This one hour talk by Dr. Devra Davis back in 2012 is a bit heavy, but has a lot of information and disturbing facts. And this video about a breast cancer in the shape of a cellphone is quite an eye opener.

All living organisms generate electromagnetic fields called a biofield. Some of the waves emitted by a cellphone are similar to this human biofield. They confuse the body.

To give a rough analogy, it's like a pilot receiving instructions from the control tower as he prepares to land his plane. Imagine if a second voice comes on the same radio speaking in an unknown language. The crosstalk will confuse the pilot as he can't make out what the control tower is saying. He will abort the landing and wait till he can hear the control tower clearly. But what if the second voice keeps babbling away, drowning out the control tower's voice, and his fuel starts to run out...

Similarly when the body is constantly bombarded with electromagnetic waves, our cells get confused, stop their regular activities and go into a protective mode. This causes biological problems like damage to our DNA, intracellular free-radical buildup, leakage in the blood-brain barrier, disruption of intercellular communication, and an increased risk of tumors.

One reason may be that the effects of radiation may show up only after years, maybe even decades. Secondly, we may not be connecting the dots. Just like people once did not connect cancer with tobacco.

The truth is many studies have linked cellphone radiation to development of brain tumors, genetic damage, and other exposure-related conditions. But a well-funded cellphone industry media machine continues to mislead us. For instance, an industry-funded study in Denmark confidently proclaimed in 2011 that cellphone use is completely safe. Here are some insights into how the industry manipulates the media.

In 2009, a review of cellphone studies was conducted by Dr. Joel Moskowitz at the University of California, Berkeley. He found that industry-funded studies tended not to associate cellphone use with a heightened risk of tumors, while public-funded studies usually found the opposite result. "This is very much like studying tobacco back in the 1950s," he says. "The industry has co-opted many researchers."

When I began this article, I was only thinking about the effects of Bluetooth on my Mi band. But I soon realized Bluetooth's harmful effects paled in comparison to the potential damage by a cellphone's radiation.

Like many people, my cellphone is my favorite toy. It's by my side, 24/7. It wakes me up, brings me news, records runs, plays music, gives messages alerts, enables replies, assists me with my schedule, lets me shoot and share photos and videos, tracks finances, stores documents, helps me navigate the roads, and lets me play games. It's mostly in my pocket unless I'm working when it resides on my desktop within hand's reach.

Putting my cellphone away is going to hurt as bad as extracting a tooth. But I won't think twice if it's a rotten tooth. So why should this be different?

Remember the cozy feeling of your warm phone in your pocket? That's the feeling of your chromosomes being toasted! Soft tissues are more affected by radiation, and a cellphone in my pocket puts my internal organs at risk.

But what is a really safe distance? My cellphone's manual recommends at least an inch away from my body. According to the Pittsburgh Cancer Institute, moving your cell phone just 5 cm (2 inches) away from your head while talking on it, reduces the electromagnetic radiation that reaches my head by 75%. It goes down to less than 1% by keeping the cell phone over 18 cm (7 inches) away from any part of your body. That's clear enough.

When I have to put my cellphone in my pocket, I now push in my wallet between it and my body. If I'm working, my cellphone sits within hand's reach but not so far that I can't read the screen. If I'm driving, it will go into the car's side pockets. Jogging time use is still an issue.

A poor signal causes the cellphone to emit more radiation as it powers up to try to link to cellphone network towers. So now if my signal strength is bad, I keep my phone away from my body.

Dual SIM cards means more radiation. So if I don't need the second number to be working all the time, I just turn off the second SIM.

Traveling is another time when a cellphone emits a lot of radiation as it keeps losing connection with one cellphone tower, and trying to connect to the next. I now use my speakerphone or headsets while travelling.

Speaking of cellphone towers, they are an even more dangerous source of radiation. Distance is again the key. If you move 10 meters away from a tower, the radiation is less than 0.1% of what it is one meter from the tower.

The longer the cellphone is in contact with your body, the more harm it does. My headset is always connected so my default answer mode is via headset. If I don't have my earphones, I switch the phone from ear to ear to cut contact time. Some researchers point out that earphones may channel the waves directly to the ear but as the effect is diluted, it's a far lesser evil.

Kids have smaller, softer skulls. This means when kids hold cellphones to their ears, the rays penetrate much deeper and cover almost all of their brains. A study by Dr. Lennart Hardell in Sweden, found that kids who began using cell phones in their teens had four to five times more malignant tumors by their late 20s as those who did not use cell phones as teenagers. Other studies have found an increase in autism over a period that closely parallels the increase in cellphone use.

Ideally, children should not use the cellphone phone network at all. I usually ask my kid to use the landline where possible. If she must use my cellphone, the call must be short, and preferably on the speakerphone.

Are Wi-Fi, cordless phones, Bluetooth, GPS safe?

The short answer is no. Gadgets like cordless phones, Wi-Fi routers, Bluetooth devices all emit electromagnetic waves, and are usually turned on 24/7.

In cordless phones, both the handset and the base station of a cordless emits radiation equal or more than a cellphone, and they do this even when they are not being used.

A Class 1 Bluetooth device emits the same amount of radiation as a cellphone. Class 2 is less and Class 3 the least. Sadly, Bluetooth device makers rarely mention what Class it is. Secondly a Bluetooth headset gives you a double dose of radiation as your cellphone is usually close to you. Using Bluetooth speakers in a car is even worse as the effect is multiplied by the radiation reflecting off the car walls like a microwave oven. As for all those Bluetooth speakers, keyboards, trackpads, mice… I know, I know, I own so many myself that I am almost in tears.

The GPS radio in your cellphones periodically transmit data to update your location. The good thing is this lets you track a lost phone. The bad is it also means another radio in the phone emitting more radiation. GPS navigational devices in cars also emit radiation. In some cases, they were found to be so excessive that the companies were blacklisted.

As for Wi-Fi, many countries are now questioning its safety in schools. I found a website maintained by UK scientists that has a whole collection of studies on the effect of Wi-Fi radiation on children. These studies suggest that Wi-Fi radiation can be linked with impaired concentration, loss of short term memory, headaches, fatigue, sleep disorders, digestive problems, depression and anxiety. Another recent study in Denmark had Danish students taking 400 cress seeds (cress is a very fast growing herb) and splitting them between two rooms. Both sets of seeds received the same amount of care, except that in one room, the seeds were placed next to two Wi-Fi routers. 12 days later, the seeds that were in the room with the Wi-Fi signals had failed to sprout while the others sprouted in the normal fashion. It's surprising there is not more public debate on these studies.

I have also unplugged the cordless, and packed it away. My landline is upstairs but if need be, I can always get a wired extension.

I often see 'experts' interpreting the statistics on existing studies to prove cellphone radiation does not harm us.

To which, I give you my favorite quote on statistics: 'Do not put your faith in what statistics say, until you have carefully considered what they do not say.' ~William W. Watt

What would my reaction be if a car manufacturer asked me to prove their car is unsafe by driving it and crash testing it?

I would laugh and say, "Sorry, I will buy the car only if you prove it's safe."

The cellphone industry's own studies prove cellphone radiation is safe, but it's unreliable as it hasn't been verified by independent agencies. In effect, they are turning around and asking me to prove cellphones are dangerous.

So why am I still buying cellphones?

Because the industry knows I'm addicted to my toys, and won't give them up.

Why are the big guys like the Apples and Googles not funding such studies in a big way? Or maybe the right question is what are they doing about it?

Google doesn't build cellphone hardware. Did it conflict with their 'Do no evil' philosophy? There are several ongoing class action lawsuits against cellphone makers. If these succeed, Google won't be affected.

Apple however will be affected. Is that why they have more liquid funds than any other company? Apple is reported to be moving into the electric car industry. Is it their way forward in a possible post-cellphone era?

While reading up for this piece, I discovered an unseen but epic battle going on between research and truth. Take the story of Professor Henry Lai of the University of Washington who with a fellow researcher, 'N.P.' Singh, studied the effects of the supposedly safe cellphone type of radiation on the DNA of rats. They found the DNA in the brain cells of the rats being damaged or broken by exposure to this radiation.

The cellphone industry stood to lose billions in medical payouts, and basic changes in cellphone design. Not surprisingly, they went all out to discredit Lai's work, and came up with new studies to counter his findings. They even tried to get him fired and succeeded in stopping the funding for his research.

In 1993, the cellphone industry was finally pressured by Congress to invest $28 million to study cell phone safety. This was due to the massive publicity of a lawsuit filed by businessman against cellphone manufacturer NEC; his wife had died of a brain tumor which he blamed on her cellphones.

Based on this, Dr. Carlo PhD, JD, was hired by the Cellular Telephone Industry Association in 1993 to lead a 7-year research program to determine if cell phones were safe. When his work revealed preventable health hazards associated with cellphone use, the industry that hired him turned against him, and he

was asked to quit. Like Dr. Lai, his work was discredited, his character questioned, and even his house was mysteriously burnt down. You can google up Dr. Carlo to read the whole story.

My beloved cellphone has been banished to a safe distance of 7 inches.

The results of the many independent research studies convince me that cellphones affect our cell DNA and cause other health issues. After all, the researchers had nothing to gain but a lot to lose by sticking out their necks.

'If you can't convince them, confuse them' seems to be the philosophy of the cellphone industry. On one hand, they have successfully funded studies to contradict independent research. On the other, they've cut off funding and discredited all studies that highlight harmful effects of cellphone radiation.

The truth is the cellphone industry is conducting a global laboratory test on four billion guinea pigs to check the effects of electromagnetic waves.

I am not a guinea pig. Are you?

https://medium.com/indian-ink/are-my-toys-playing-with-my-dna-31f8c5809d6c

What Will Happen When They Know?

February 22, 2017

What happens when a false belief collides with reality? This is the question of our time. Do you shift course and change or double down or continue on as though nothing has happened? Does wealth and power allow you to change the laws of physics or biology? What happens when the majority of people have accepted a reality and you are now not only wrong, but in the minority? What happens when denial is no longer an option?

It's easy to point to politicians and business leaders who are challenged by reality. It's much harder when this situation appears in your own life. What happens when a reality undermines your identity in the world? Will you listen, even when the answer is something you don't want to hear? Will you be able to change your mind, even though you have invested your time and money? Will you take a stand to prevent others from being harmed? Will you resist change even when harm to yourself is inevitable? Or have you even lost the capacity to change at all?

There is a train wreck about to happen in Silicon Valley as two grand ideas collide with reality. Larry Page from Google and others are making plans to focus on health and how to extend human life. Facebook founder Mark Zuckerberg and his wife Dr. Priscilla Chan have asked the question, "Can we cure all diseases in our children's lifetime?" and have pledged $3 billion dollars toward that goal.

Another inspiring goal in Silicon Valley is to bring Internet access to everyone on the planet. The goals around health and Internet access both seem incredibly empowering at face value. The conflict between them only appears when you re-evaluate the false assumption that wireless technology is safe, and you read the mounting evidence of harm, the thousands of studies that have been amassed over decades by hundreds of researchers around the world.

A truly safe technology would not cause damage to DNA. It would not increase free radical damage or contribute to an increased risk of cancer. It would not negatively impact sleep or the nervous system. It would not open up the protective blood brain barrier. It would not increase inflammation, a factor in all chronic disease. Published studies have found all of these effects, and many more.

Finding this evidence and reading through it is hard. But what makes this truly challenging is seeing evidence that this harm has been known for decades by the US government, well before cellular technologies were licensed and sold to consumers . Some of the companies even tried to "wargame" and confuse the science, something that even tobacco companies did not attempt to do. A Harvard ethics paper has been written on this topic.

It is clear that some people have known about this harm for decades, but most people in Silicon Valley are completely unaware of it. So, what will happen the day that Larry Page gets this information from one of his health care researchers at Calico Labs? Or if he types in a Google or Google Scholar search and finds published research about the detrimental health effects of wireless? Will he realize that Google's plans to use wireless in the US and in balloons around the world is in direct conflict with his goal to extend human life?

What will happen the day when Dr. Priscilla Chan, a pediatrician, reads the American Academy of Pediatrics latest recommendations to reduce wireless exposure for children? What will she tell her husband Mark Zuckerberg, founder of Facebook, who is developing drones to provide wireless coverage to the most unreachable corners of the planet?

What will Elon Musk do when he discovers that one of the biggest challenges of getting to Mars (shielding astronauts from the health impacts of ionizing cosmic radiation) is not much different from protecting Solar City customers from the radiation emitted by smart meters, wireless solar monitors, and solar power inverters? Will he change his proposed rollout of SpaceX satellites to provide worldwide Wi-Fi coverage?

The hardest parts of this problem are not technical. They are the same patterns of attitudes and beliefs and ego that have plagued humans for as long we have existed.

I don't know what these individuals will do. I only know that accepting this was hard for me, and I hadn't made public commitments to billions of people or invested large amounts of money in this endeavor, as Page, Musk, and Zuckerberg have. I can only hope and pray, that they will make wise choices. That their high intentions for humanity will continue and they will muster the courage to face the hard reality that these exposures are harmful. That they will help make Internet access safer than it currently is and eventually completely safe. And in the end, that we will share information and empower each other without sacrificing our health or the health of our children.

http://www.clearlightventures.com/blog/2017/2/22/what-will-happen-when-they-know

If Wi-Fi and cell phone radiation are safe, why has Belgium's telecomm boss banned them from his offices?

99 percent of the population continues to use Wi-Fi and other wireless devices without a second thought, but a growing number of people are becoming increasingly concerned with the health issues surrounding the use of these technologies. Didier Bellens happens to be one of these people. What makes Mr. Bellens different is that he also runs Belgacom, the largest telecommunications company in Belgium. His concern is such that not only has he chosen to do without Wi-Fi on the 27th floor of Belgacom where his office is situated, he also chooses to do without a cell phone; only taking calls on the office's landline.

You would think as the president of Belgacom, Bellens might choose to be a little less vocal about his concerns surrounding the use of Wi-Fi and cell phones; however, he has no qualms about educating others about these issues, especially those of the younger generation. As Bellens explains, "during the day, it is better to use a headset because the GSM, it heats." He goes on to say. "The waves are dangerous. At night, it is better to shut it off."

Bellens' claims may not be as outlandish as they may first seem. In early 2011, the World Health Organization (WHO) classified radiation from devices like cell phones and Wi-Fi as a 'Possible Human Carcinogen' (Class 2B).

In 2007, the BioInitiative Working Group reviewed 30 years of scientific studies documenting bio-effects and adverse health effects from these electromagnetic field (EMF) exposures. It concluded that "the existing public safety limits are inadequate." The newly published 2012 BioInitiative report written by 29 independent scientists from around the world says the situation is much worse than thought in 2007.

There are many concerns surrounding the use of cells phones. One of the most worrying is the link to brain tumors. In addition to a myriad of other health complications, Professor Joel Moskowitz of the University of California, Berkeley found, through compiling the research findings of every study conducted on the link between brain tumors and cell phone usage, "consistent evidence that heavy cell phone use for a decade or longer increases brain tumor risk at least 30%."

And just how dangerous is the microwave radiation emitted by Wi-Fi?

The radiation levels emitted by Wi-Fi are admittedly low. But the problem is the nature of these EMFs. These pulsed and modulated frequencies are particularly biologically damaging, and the accumulation of all these sources and options that are a real concern.

The concerns with using Wi-Fi center around the discoveries Dr. Magda Havas, Ph.D., Associate Professor of Environmental & Resource Studies at Trent University, has made over the years through her research and visiting sites where Wi-Fi use is high, e.g., schools.

Dr. Havas found those exposed to Wi-Fi experience:
- Headaches
- Dizziness
- Feeling out of place
- Rapid heart rate
- Heart arrhythmia

• Clumped blood cells, which among other things, can lead to fatigue, numbness, and nausea

Research shows exposure to Wi-Fi can:
• Perpetuate cancer growth
• Cause permanent DNA damage
• Compromise the immune system
• Affect a male's sperm

There is even limited evidence of autism.

If more telecommunications company bosses followed Bellens' lead and told the truth about these radiation emitting consumer goods at least people could use these technologies in full knowledge of the potential risk to their health. Wishful thinking?

http://www.naturalnews.com/038702_cell_phone_radiation_dangers_Belgium.html

Next time you're on a cellphone looking up at those long lingering plumes spreading across the sky, you might decide to end that call

If you spot any cell towers, roof-mounted transmitters or high-voltage power lines within a mile of your location, you may wish to evacuate the area immediately.

And once home, you will want to permanently disconnect all wireless devices, including computer routers and "always-on" portable phone cradles.

Because what you see in the sky is what you breathe. And chances are you've been breathing barium for more than a decade.

Barium Conducts Electromagnetic Energy — Blame it on Capt. Kirk
Ever since Captain Kirk teleported to the surface of an alien planet and whipped out his portable communicator, everyone Earthside wanted one. And the telecos gave us flip-phones. Along with compulsive texting, streaming video, online gaming and banking, the worldwide web and more.

It took more than 20 years to connect the first billion subscribers. But only another 40 months to connect the second billion. The three billionth "user"• placed a cell phone call just 24 months after that.

Never before in human history have so many embraced such risky technology so fast. In Toronto alone, there are 7,500 cell towers. In the USA: over 190,000.

BioElectric Beings
Everyone fixated on Captain Kirk's hand-phaser. But his wireless communicator was the real ray gun that could not be dialed down.

Cell phones and "cellular networks" are aptly named. Every transmission disrupts your cells directly.

"Human beings are bioelectrical systems. Our hearts and brains are regulated by internal bioelectrical signals. Environmental exposures to artificial EMFs can interact with fundamental biological processes in the human body," states the landmark BioInitiative metastudy.

As former microwave warfare expert Barry Trower points out, an invisible ocean of electromagnetic waves from radio, radar and TV transmissions, cell towers, smart grids and overhead power cables traveling at the speed of light "can all be reflected and refracted" by metal appliances, rain, snow, glass and conductive materials deliberately sprayed into the air.

You Are an Antenna
A water-filled upright human is a sizeable antenna. And since all moving electrons generate electrical current, all those electromagnetic waves inundating our everyday lives pass into our bodies, where they each generate an electric current.

These induced electric currents change the charge on which our complex bioelectrical body/brain/heart network operates to maintain our health and vitality.

Microwaves at 1/10th British safety guidelines emit frequencies causing the biggest changes in cell calcium levels… as reported in the UK Daily Mail.

Wireless Headaches

Headaches can stem from microwave-induced leakage of harmful molecules through the blood-brain barrier. [Electronics Australia Magazine Feb/00]

At one-ten-thousanth of a watt, the blood-brain barrier opens, allowing blood proteins inside to disrupt brain signals and start killing brain cells. A cell phone typically transmits at 2 watts.

Just two minutes on a cell phone, or sitting near a wireless computer router or portable phone cradle, shorts-circuits the electrical ion activity powering the blood-brain barrier.

This allows proteins and other blood toxins to enter the brain and resume damaging neurons in thinking and memory centers.

Dr. Leif Salford is finding "astonishing number of dead neuron cells, actually suffering holes in their brains from the damage" caused by a single cell phone call.

No wonder wireless-altered brains lead to lack of concentration, memory loss, aggressive behavior, accelerated aging, impaired learning ability and dementia.

Fibrils of proteins clumping in electromagnetically-altered brains are an identifying characteristic of Alzheimer's, Early Onset Alzheimer's, Parkinson's, Fibromyalgia, Multiple Sclerosis and cancer patients.

"There is strong evidence that… microwaves are associated with accelerated aging (enhanced cell death and cancer) and moods, depression, suicide, anger, rage and violence, primarily through alteration of cellular calcium ions and the melatonin/serotonin balance," writes veteran EMF researcher Dr. Neil Cherry in New Zealand.

So Far, So Bad

While hundreds of millions of wireless addicts insist that nothing negative is happening, the effects of this invisible plague are worsening. In the United States, one in six children currently suffers neurological disability.

With the much heralded new 4G LTE networks and devices "producing a waveform that maximizes radiation absorption for 3-6 year olds,"• writes Simon Best, the accelerating trend is straight up.

The electrosmog blanketing cities worldwide would resemble the murky view from Shanghai's high-rise windows if it were visible.

Just add micro-particulate fallout from undisclosed aerosol spray programs and one in three people can expect to be diagnosed with asthma.

Low frequencies are directly linked with epidemic rates of dementia that threaten to bankrupt Canada, the USA and much of the world within a few decades — just as the challenges and costs of crop-killing climate-shifts, sea-level rises and increasingly costly oil will require all the smarts and cash we can muster.

"The scope of the looming medical-care disaster is beyond comparison with anything that has been faced during the entire history of humanity," declares dementia expert Dr. Barry Greenberg in Toronto.

"The medical-care system is going to be bankrupt by 2050 if we don't figure out a way to delay or treat Alzheimer's disease," echoes U.S. health and human services secretary, Kathleen Sebelius.

Brain cell membranes made leaky by electromagnetic radiation exposure create enough energy to excite neurons into hair-trigger mode, overloading hyperactive brains.

More than 1 in 10 children in the United States are currently diagnosed with Attention Deficit/ Hyperactivity Disorder.

A 6,000% increase in autism diagnosis in recent years has kept pace with the proliferation of wireless grids and gadgets.

As reported in the UK Telegraph, 1980 to 2000 saw an increase of nearly 50% in the estimated number of new cases of Malignant Brain/Central Nervous System tumors in the United States.

Anyone who starts using wireless devices at any age can expect a 500% risk of developing brain cancer within 10 years – even sooner for children. Using cell and cordless phones is even worse.

"For such a risk to show up in cellphone users within 10 years, given what we know about brain tumors, which is that they can have a latency of 40 years, is deeply, deeply disturbing," worries Dr. Devra Davis. [MSN June 7/04; Globe & Mail Sept 24/10]

Bye Bye Babies

Up to 16% of North American couples are already experiencing infertility – a near doubling since 1992. In cell tower-festooned Delhi, one in four couples cannot conceive after trying for two years or longer. Surviving sperm are increasingly found to be too damaged to achieve fertilisation. [TNN Aug 13/09]

At current rates, plummeting global sperm counts will hit 'zero' by 2048.

Embryos, fetuses, infants and children are especially vulnerable to pulsed wireless signals, which penetrate directly through their rapidly developing bodies and brains.
"Children who were exposed to cell phones before and/or after birth tended to have higher prevalence of emotional symptoms, behavioral problems, inattention, hyperactivity and problems with peers," says prominent EMF researcher Professor Kjell Mild in Sweden.
Children and teenagers are five-times more likely to develop brain cancer if they use cell phones.

Microwave Sickness is already of significant public concern in countries where wireless technologies were introduced some 10 years ahead of North America.

"Hot spots" include Sweden, Denmark, France, Germany, Italy, Switzerland, Austria, Greece and Israel.

Sweden leads the pack. Data collected by the Swedish government has found that the introduction of cellphone technology nationwide in 1997 coincided with an alarming increase in prostate cancer, brain tumors, melanomas and lung cancers.

So did deaths from Alzheimer's, traffic accident injuries, sick leave rates, and the numbers of infants born with heart problems.

With a quarter-million residents now on permanent paid disability for microwave illness, Sweden changes everything. [Pathophysiology June/09]

Widespread common complaints of Microwave Sickness include, but are not limited to:

- aching joints
- asthma attacks
- fierce headaches
- sudden dizziness
- rashes and sores
- gastro-intestinal discomfort
- persistent dry hacking cough
- inability to concentrate or remember simple things
- heart flutter, inflammation, stoppage

"Cell phones have enjoyed exceptional freedom from government oversight and control to protect against health and environmental hazards," comments Dr. John Wargo, professor of Environmental Risk and Policy at Yale University.

http://humansarefree.com/2016/04/wireless-chemtrails-and-you.html

The Kids Are Not All Right

How Wireless Tech Is Harming Our Youth and What Parents Can Do Right Now

"Children are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children." —American Academy of Pediatrics, 2013

Don't run with scissors. Don't talk to strangers. Don't play with matches. Don't drink and drive. Don't do drugs. Parents are eternally concerned about their children's safety. From infancy to adolescence, children are developing humans—physically, behaviorally and intellectually. To emerge as healthy, well-adjusted adults, kids need their parents' protection. And when it comes to children and wireless-tech safety, there's a lot parents need to know.

What is Wi-Fi, Really? We can't see Wi-Fi with the naked eye—but we're surrounded by it, 24/7. Wireless technology encompasses our cell phones, tablets, cell towers, smart meters, wireless-enabled laptops, baby monitors, gaming consoles, e-readers, virtual-reality toys and the emerging Internet of Everything. The term "Wi-Fi" sounds harmless enough, right? Its utterance like a baby's coo or cartoon slang. It alliteratively conjures "Sci-Fi" flying cars and time travel. But let's call wireless tech what it really is— radiofrequency radiation, also called microwave radiation. Technically speaking, "Wi-Fi deploys pulse modulated microwave radiation (within the larger radiofrequency spectrum) with a carrier frequency that is similar to that used by a microwave oven (about 2.45 gigahertz)."5 In 2011, the International Agency for Research on Cancer classified radiofrequency radiation as "possibly carcinogenic to humans." This is the same category as lead, DDT, and other pesticides.

Who's at Risk? Science shows that wireless radiation can cause a gamut of biological effects, from cancer and neurodegenerative diseases to birth defects and infertility. And yet, outdated world-wide safety regulations only consider short-term heating (i.e., thermal) and shock effects. They don't consider the chronic, non-thermal exposures of our wireless tech world.2 As a human population, we are all at risk from environmental exposures and toxins. But, the most vulnerable are children, the developing fetus and pregnant women. A child's brain, nervous system and immune system are in development at these critical periods. Despite this, "there is a growing, unchecked and unregulated availability of a range of transmitting equipment specifically aimed at parents of babies and young people."2 Yes, this includes that wireless baby monitor (2 inches from your baby's head), that working cell phone in your toddler's mouth, or that tablet broadcasting under your teen's pillow—all these seemingly innocuous devices can be hazardous to your child's health.

"Around the world we are paying the price now for having delayed actions on tobacco and asbestos after insisting on human harm before taking action. We cannot afford to wait for definitive proof of human risks from radiation emitted by wireless transmitting devices before taking steps to reduce exposures. The absence of evidence of hazard is not proof of safety"—says Dr. Devra Davis, president of the Environmental Health Trust and visiting professor at the Hebrew University Hadassah Medical School and Ondokuz Mayis University, Turkey.

Who is SAM? Standing for "Specific Anthropomorphic Mannequin," SAM is a plastic model of a head, which, in 1989, was made to represent the top 10 percent of U.S. military recruits. That's a 220-pound man with a pretty large head. SAR, another relevant acronym, stands for "Specific Absorption Rate"—a measure of tissue-radiation exposure.9 The cell phone industry currently uses SAM for compliance

testing against safety guidelines and to certify the SAR for mobile phone users. However, research shows that a smaller head than SAM will absorb significantly more radiofrequency radiation.12 Obviously, children's smaller heads have a shorter distance to the brain center. Also, children's skulls and ears are thinner, allowing radiation to penetrate farther. And children's brains contain more fluid, and thus absorb more radiation.4, 12 The SAR for a 10-year-old is up to 153 percent higher than the SAR for the SAM model,1 yet there is no pre-market certification testing for SAR on a childequivalent head (or an adult's head smaller than SAM). And "when electrical properties are considered, a child's head's absorption can be over two times greater, and absorption of the skull's bone marrow can be 10 times greater than adults."

What Does the Latest Science Say? In May 2016, the National Toxicology Program released partial findings of their $25 million study on cell phones and cancer. The results showed that exposure to wireless radiation significantly increases the prevalence of highly malignant heart and brain cancers in rodents. "The findings of brain tumors (gliomas) and malignant Schwann cell tumors of the heart in the NTP study, as well as DNA damage in brain cells of exposed animals, present a major public health concern because these tumors occurred in the same types of cells that had been reported to develop into tumors (gliomas and acoustic neuromas) in epidemiological studies of adult cell phone users," explains Ron Melnick, Ph.D., senior toxicologist and director of Special Programs in the Environmental Toxicology Program at the National Institute of Environmental Health Sciences, National Institutes of Health, now retired. In response to these results, the American Academy of Pediatrics issued new recommendations for reducing exposure to cell phones and wireless devices. In an AAP press release, Jennifer A. Lowry—M.D. and chair of the AAP Council on Environmental Health Executive Committee—said: "They're not toys. They have radiation that is emitted from them and the more we can keep it off the body and use (the phone) in other ways, it will be safer."

Microwave Tech in Schools

Computers and the Internet are vital learning tools. But the crux of the matter with wireless tech is safety. And this rampant technology has never been tested for the longterm, overlapping, cumulative exposures experienced in today's schools by the most vulnerable population: children. Students in schools are bombarded with wireless radiation from every conceivable angle: their own personal devices, the devices of all nearby users in surrounding classrooms, wireless devices in the school itself (routers, printers, smart boards, etc.), and transmitters (i.e., cell towers) in close proximity outside the school. Plus, to simultaneously handle the hundreds of devices needed to conduct its daily activities, schools typically install stronger Wi-Fi systems. Most residential homes now have Wi-Fi hubs and multiple devices per household member—meaning that when kids return home, they get no respite.

Consequently, in schools across the world, kids are getting sick from this unprecedented level of wireless exposure. Dafna Tachover, founder of We Are The Evidence—an advocacy group for those injured by wireless technology—is an attorney in both Israel and New York. She regularly works with children and parents who have developed electro-sensitivity to wireless tech. Symptoms commonly reported include: headaches, nausea, vomiting, cognitive problems, tingling, severe exhaustion, noise sensitivity, sinus pressure and nose bleeds. In a case submitted to the Israeli Supreme Court, Tachover presented 200 children, from six schools, who had become sick from wireless tech. In one particular school, 70 children from three classes started having symptoms after a second wireless router was installed. Tachover uncompromisingly states: "Our school systems are creating the most intense environment of radiation, and they're doing it to the most sensitive population. The harm has already been proven. There's an

epidemic of sickness in the schools." After significant efforts, in April 2016 the city of Haifa, in Israel, ordered all Wi-Fi to be disconnected in schools. In a press release, Haifa's mayor, Yona Yahav, is cited saying, "When there is a doubt, when it comes to our children, there is no doubt." This is a step in the right direction, but internationally there continue to exist countless groups of concerned parents and researchers urging school administrations to adopt best tech practices. Schools can get the same educational benefits from a wired (fiber-optic and Ethernet) network, and in doing so, they wouldn't be putting an entire generation of kids at risk.

There's No Wi-Fi in Narnia

Some schools are now rolling out virtual-reality curricula, like the Google Expeditions Pioneer Program. Sure, it sounds cool to take a trip to Mars without leaving the classroom. But, hold that virtual-reality visor up to a child's eyes, and what you've got is a cell phone encased in a cardboard box, beaming microwave radiation directly into a child's brain. Whether used in school or at home, virtual-reality toys have never been premarket tested for health consequences. Dr. Mary Redmayne, a researcher at Monash University in Australia, explains: "Children's brains are not fully myelinated and eyes absorb radiation readily due to their high water content. Placing a two-way microwave radiating device directly in front of young eyes is not a wise choice in my opinion."

Theodora Scarato—Environmental Health Trust's director of Public Affairs and Educational Resources—speaks to another angle regarding digital play. "The research shows that simpler is often better in terms of toys. When you have a bunch of building blocks, then a child can use their own creativity to imagine what these blocks are. But when it's already pre-scripted, the child is using less creativity, because the choice has already been taken away. You can only be as creative as the program application is. And that is stifling. When I listen to children tell me about what they imagine in their minds, I'm always blown away. A computer's drop down menu can't even come close."

Tech Addiction

"A representative survey of American tweens (8- to 12-year-olds) and teens (13- to 18-year-olds), documented that outside of school and homework, tweens spend almost six hours per day (5:55 hours) and teens spend almost nine hours per day (8:56 hours) using media."11 While "Tech Addiction" is not yet classified as a disorder in The Diagnostic and Statistical Manual of Mental Disorders, the phenomenon is nonetheless being investigated by a host of psychologists and researchers. Clinical psychologist Catherine Steiner Adair sheds light on the impact of the omnipresent glowing screen within the family dynamic: "Everything a baby needs from its environment between birth and 2 years comes from people, from relationships with people and interactions with the environment—physically exploring, playing, crawling, and interacting with others. When we triangulate our relationship with our babies and tech, we compromise that essential connection."10 Further, "the development of empathy is a critical step in early childhood and over a lifetime. Empathy is the caring glue that creates our humanity, our compassion."10 We learn empathy through direct human contact. This is thwarted when kids correlate personal identity with their Xbox avatar or their Facebook status. The blood in Halo isn't real; sad-face emojis aren't tears. When disconnected from real-life interaction, kids don't learn accountability for negative actions or mean words. What kind of society will emerge when our technology-obsessed youth is decoupled from the tangibility of human consequences?

Like a Kid in a Candy Store

An apt allegory might be Roald Dahl's Charlie and the Chocolate Factory. Faced with his tempting, addictive, untested, fantastical inventions, the story's overindulgent kids were squeezed, colorized, ballooned and miniaturized, while their parents stood idly by and watched—all for Mr. Wonka's industrial benefit and profit. Kids today should not literally be left to their own devices. The proliferation of wireless radiation is the biggest public health experiment ever conducted, and it's happening on an entire generation of children. Do you want to experiment on your kids?

https://alisonmain.files.wordpress.com/2017/01/2-17_pm_the-kids-are-not-alright.pdf

Autism may be Linked to Electromagnetic Radiation Levels In Mother's Bedroom During Pregnancy

Incidence of autistic babies has increased from 1 in 150 in 2002 to an estimated 1 in 50 babies today. Dr. Dietrich Klinghart, MD, PhD of the Institute of Neurobiology in Seattle recently conducted a pilot study to assess the potential role of electromagnetic frequencies in the dramatic rise in autism and other neurological impairments over the past decade. Various measurements of electromagnetic radiation exposure were assessed in the case of 10 children with neurological impairment, 8 categorized with Autism Spectrum Disorder. Data was obtained for:

1) Mothers' Body Voltage in the mothers' sleeping location during pregnancy;
2) Child's Body Voltage in current sleeping location;
3) Microwave Power Density in mothers' sleeping location during pregnancy (microwatt/square meter); and
4) Child's Microwave Exposure in current sleeping location.

Data for mothers with neurologically impaired children were contrasted with similar data for 5 healthy children and their mothers.

This pilot data strongly suggests that electromagnetic radiation in the sleeping environment of mothers during pregnancy, as well as electromagnetic radiation in the sleeping environment of children, may be key undiscovered contributing if not causative factors in neurological impairments in children, including autism. Given increasing levels of ambient electromagnetic radiation in modern environments from society's use of electronic equipment, wireless technologies, such as cell phones and wireless networks, high frequency transients on electric lines, and broadband over power lines (BPL), this association needs immediate further exploration.

http://electromagnetichealth.org/media-stories/#Autism

Autism and EMF? Plausibility of a pathophysiological link - Part I.

Abstract

Although autism spectrum conditions (ASCs) are defined behaviorally, they also involve multileveled disturbances of underlying biology that find striking parallels in the physiological impacts of electromagnetic frequency and radiofrequency exposures (EMF/RFR). Part I of this paper will review the critical contributions pathophysiology may make to the etiology, pathogenesis and ongoing generation of core features of ASCs. We will review pathophysiological damage to core cellular processes that are associated both with ASCs and with biological effects of EMF/RFR exposures that contribute to chronically disrupted homeostasis. Many studies of people with ASCs have identified oxidative stress and evidence of free radical damage, cellular stress proteins, and deficiencies of antioxidants such as glutathione. Elevated intracellular calcium in ASCs may be due to genetics or may be downstream of inflammation or environmental exposures. Cell membrane lipids may be peroxidized, mitochondria may be dysfunctional, and various kinds of immune system disturbances are common. Brain oxidative stress and inflammation as well as measures consistent with blood-brain barrier and brain perfusion compromise have been documented. Part II of this paper will review how behaviors in ASCs may emerge from alterations of electrophysiological oscillatory synchronization, how EMF/RFR could contribute to these by de-tuning the organism, and policy implications of these vulnerabilities. Changes in brain and autonomic nervous system electrophysiological function and sensory processing predominate, seizures are common, and sleep disruption is close to universal. All of these phenomena also occur with EMF/RFR exposure that can add to system overload ('allostatic load') in ASCs by increasing risk, and worsening challenging biological problems and symptoms; conversely, reducing exposure might ameliorate symptoms of ASCs by reducing obstruction of physiological repair. Various vital but vulnerable mechanisms such as calcium channels may be disrupted by environmental agents, various genes associated with autism or the interaction of both. With dramatic increases in reported ASCs that are coincident in time with the deployment of wireless technologies, we need aggressive investigation of potential ASC - EMF/RFR links. The evidence is sufficient to warrant new public exposure standards benchmarked to low-intensity (non-thermal) exposure levels now known to be biologically disruptive, and strong, interim precautionary practices are advocated.

https://www.ncbi.nlm.nih.gov/pubmed/24095003

Study Uncovers How Electromagnetic Fields Amplify Pain in Amputees

For years, retired Maj. David Underwood has noticed that whenever he drove under power lines and around other electromagnetic fields, he would feel a buzz in what remained of his arm. When traveling by car through Texas' open spaces, the buzz often became more powerful.

"When roaming on a cellphone in the car kicked in, the pain almost felt like having my arm blown off again," said Underwood, an Iraq War veteran who was injured by an improvised explosive device (IED). His injuries have resulted in 35 surgeries and the amputation of his left arm. Shrapnel from the IED also tore part of his leg and left him with more than 100 smaller wounds. "I didn't notice the power lines, cellphones on roam or other electromagnetic fields until I first felt them in my arm."

Until a recent study led by researchers at The University of Texas at Dallas was published online last month in PLOS ONE, there was no scientific evidence to back up the anecdotal stories of people, such as Underwood, who reported aberrant sensations and neuropathic pain around cellphone towers and other technology that produce radio-frequency electromagnetic fields.

"Our study provides evidence, for the first time, that subjects exposed to cellphone towers at low, regular levels can actually perceive pain," said Dr. Mario Romero-Ortega, senior author of the study and an associate professor of bioengineering in the University's Erik Jonsson School of Engineering and Computer Science. "Our study also points to a specific nerve pathway that may contribute to our main finding."

Most of the research into the possible effects of cellphone towers on humans has been conducted on individuals with no diagnosed, pre-existing conditions. This is one of the first studies to look at the effects of electromagnetic fields (EMFs) in a nerve-injury model, said Romero-Ortega, who researches nerve regeneration and builds neural interfaces — technology that connects bionic or robotic devices to the peripheral nerve. There are nearly 2 million amputees in the United States, according to the Centers for Disease Control and Prevention, and many suffer from chronic pain.

After interacting with Underwood, Romero-Ortega decided to study the phenomena that Underwood described.

The team hypothesized that the formation of neuromas — inflamed peripheral nerve bundles that often form due to injury — created an environment that may be sensitive to EMF-tissue interactions. To test this, the team randomly assigned 20 rats into two groups — one receiving a nerve injury that simulated amputation, and the other group receiving a sham treatment. Researchers then exposed the subjects to a radiofrequency electromagnetic antenna for 10 minutes, once per week for eight weeks. The antenna delivered a power density equal to that measured at 39 meters from a local cellphone tower — a power density that a person might encounter outside of occupational settings.

Researchers found that by the fourth week, 88 percent of subjects in the nerve-injured group demonstrated a behavioral pain response, while only one subject in the sham group exhibited pain at a single time point, and that was during the first week. After growth of neuroma and resection — the typical treatment in humans with neuromas who are experiencing pain — the pain responses persisted.

"Many believe that a neuroma has to be present in order to evoke pain. Our model found that electromagnetic fields evoked pain that is perceived before neuroma formation; subjects felt pain almost immediately," Romero-Ortega said. "My hope is that this study will highlight the importance of developing clinical options to prevent neuromas, instead of the current partially effective surgery alternatives for neuroma resection to treat pain."

Researchers also performed experiments at the cellular level to explain the behavioral response. That led researchers to explore the protein TRPV4, which is known to be a factor in heat sensitivity and the development of allodynia, which some subjects displayed.

"It is highly likely that TRPV4 is a mediator in the pain response for these subjects," Romero-Ortega said. "Our calcium imaging experiments were a good indicator that TRPV4 is worth further exploration."

Romero-Ortega said since the research produced pain responses similar to those in anecdotal reports and a specific human case, the results "are very likely" generalizable to humans.

"There are commercially available products to block radio frequency electromagnetic energy. There are people who live in caves because they report to be hypersensitive to radiomagnetism, yet the rest of the world uses cellphones and does not have a problem. The polarization may allow people to disregard the complaints of the few as psychosomatic," he said. "In our study, the subjects with nerve injury were not capable of complex psychosomatic behavior. Their pain was a direct response to man-made radiofrequency electromagnetic energy."

At one point in the study, members of the research group showed Underwood video of subjects in the experiment and their response to radiofrequency electromagnetic fields.

"It was exactly the same type of movements I would have around cellphones on roam, power lines and other electromagnetic fields," said Underwood, who has served on congressional medical committees and been exposed to some of the best doctors in the world. "It is pretty amazing that a few short conversations with this team led to validation of what I, and many others, experience."

Researchers said that the next step is to develop devices that block neuropathic pain from radiofrequency electromagnetic energy.

Dr. Bryan Black, a research associate in the Department of Bioengineering in the Jonsson School; Dr. Rafael Granja-Vazquez, a postdoctoral fellow at UT Dallas; Dr. Benjamin Johnston of Brown University; and Dr. Erick Jones Sr., a professor of industrial, manufacturing and systems engineering at UT Arlington, also contributed to the work.

http://www.utdallas.edu/news/2016/2/3-31891_Study-Uncovers-How-Electromagnetic-Fields-Amplify-_story-wide.html

Krakow's bold step to curb electromagnetic pollution reflects growing evidence of harm

12th January 2017

As Kraków, Poland's second city, takes steps to protect its citizens from rising electromagnetic 'smog' from mobile phones, Wi-Fi, Bluetooth, smart meters and other devices, Lynne Wycherley summarizes 2016's news highlights on the emerging bio-risks of rising exposure to non-ionizing radiation. For how much longer can governments continue to ignore the growing evidence of harm?

The first mayor of Kraków to be elected by popular ballot, law professor Jacek Majchrowski is tackling an environmental issue most governors avoid: the electromagnetic pollution in his city.

Following work on air pollution, and in response to growing demand, he is initiating forums for citizens to discuss the growing 'smog' of electro-magnetic fields (EMFs).

In a world first he is also initiating the provision of meters to detect radio-frequency (RF) / extremely low frequency (ELF) EMFs so people can collect objective data on their exposure.

In December, Majchrowski hosted an international conference on EMF pollution and citizens' 'right to information' - an echo of the new Right to Know law in Berkeley, California (cell-phone sellers must supply safety information).

Speakers included Sławomir Mazurek, a pro-reform Polish minister for the Environment. Majchrowski and his team are now re-zoning mobile-phone masts (cell towers) to reduce EMF exposure levels.

With similar boldness, Argentina's Lower National Congress proposed a new health law last year to regulate electromagnetic pollution.

Supported by trade unions and NGOs, its radical draft measures included hard-wired networks in schools (also hospitals) - recalling the recent Green-led French law on *"electromagnetic sobriety"* (2015) and recommendations of the American Pediatrics Society and British Doctors' Initiative.

Across the planet, 2016 had seen a paradoxical trend: anthropogenic radiation from mobile and wireless trends continued to rise rapidly, alongside striking, under-reported findings on its possible bio-risks.

Cell-phone use was still climbing. India alone reached over 1 billion verified subscriptions. But like Wilde's picture of Dorian Gray, the small screens endlessly sold to us harboured a troubling reality. In May, researchers in the USA's $25 million National Toxicology Programme released early warnings (later stated in detail). Cell-phone radiation had shown clear tumor-promoting effects in the hearts and brains of the rats under study.

In Britain, meanwhile, neuroscientist Dr. Sarah Starkey published a key peer-reviewed paper (October 2016) that exposed shocking bias in the 2012 report by AGNIR, the Advisory Group on Non-ionising Radiation - a report behind many governments' take-no-action health policies, including the UK's. And one which (as she demonstrates) blatantly excludes the peer-reviewed precautionary science.

Long buried by Germany's government, a report offering a rare window on 878 Russian-language science papers (1960-1997) was finally translated, with updates, into English. Long-term studies on Soviet workers repeatedly charted chronic debilitation from weak EMFs - including pulsed microwaves that have been commercially 'repackaged' for today's telecoms.

Though research protocols differed from those current today, raising potential questions, the author, medical Professor Karl Hecht, persuasively condemns his government - and the West as a whole - for its reliance on short-term studies.

But escalating trends were in train. In July, the USA's Federal Communications Commission approved unbridled commercial development of 5G, (July), despite serious question-marks about the new electromagnetic radiation being lined up for use, and the spiraling public exposure it would bring.

A parallel trend for hidden transmitters saw more antennae disguised as birdboxes - and now as cables (January 2017) - the polar opposite of 'right to know'.

Whilst BT ran adverts for *"the most powerful Wi-Fi in the world"* (UK), newly published papers continued to show DNA or organ damage to Wi-Fi-exposed animals - raising questions about our habitual close exposure to routers / boosters.

And while the ITU (International Telecoms Union) told the United Nations that 95% of the world's population had mobile phone-mast coverage (July), with added 4G/LTE supplying 53%, a landmark study in Germany (September) revealed progressive harm to trees from the growing microwave radiation. Strongly irradiated trees, even two miles from antennae, died back, often to the point that they were felled.

Similarly troubling, a Greek study of pollinating insects found that many species decreased in step with phone-mast radiation (Lázaro et al). Underground-nesting species fared much better - an imbalance, the authors noted, that could have wide eco-impacts, or affect crops.

Other 2016 peer-reviewed studies on phone-masts (cell towers) found genetic effects in nearby residents. *(See also Gandhi 2015) plus lab-demonstrated amputee pain from the pulsing output.)*

A study on Antarctic krill (March) found that navigation was disrupted by an exceptionally weak radiofrequency field. Research showing insect cell-death from 6 minutes' weak wireless exposure added to previous, similar findings (a, b, c) on Bluetooth etc. Both hint at a need to monitor our fast-rising, non-ionizing radiation.

In Los Angeles, a young director began filming *Generation Zapped*, a courageous documentary on smartphone / wireless risks. Now in its late stages of production, it attracted wide support.

Psychiatry professor Nicholas Kardaras, an expert in addiction, published his gripping book *Glow Kids: how screen addiction is hijacking our kids* (USA). Drawing on his clinical experience of over 1,000 teenagers, he adopted the term *"digital heroin"* for interactive small screens.

Sharing evidence for addiction-hallmark brain changes, however, he neglected plausible links with the wireless radiation itself (published RF risks to the prefrontal brain / opioid receptors).

A survey suggested US smartphone ownership began, on average, at age 10. Around the world, research showing children's cell-phone radiation absorption was higher than adults' - especially in the brain and bone marrow - continued to be overlooked. As did Russia's 4-year study on multi-tested cognitive decline in 7 to 12 year-olds using cell phones (2011), a contrast to milder, short-term findings elsewhere.

Cell-phone risks to the blood-brain barrier which shields the brain from toxins - long highlighted by Professor Salford - found support in a new study. Professor Hardell (who called for pulsed RF to be upgraded to a Class 1 carcinogen in 2014) co-published on whether cell-phones might be a possible, hidden factor in the rise of thyroid cancer.

And a review of 21 studies showing RF/cell-phone risks to male fertility (Houston 2016) concluded that free radical damage played a key role.

Outside Sweden, human rights continued to be denied to the rising numbers of adults and children testifying to EHS (severe 'electrosensitive' symptoms).

Reviewing up to date biological evidence, the European Academy for Environmental Medicine recommended low pulsed-microwave exposure limits (0.006 V/m) for those affected - far lower than from today's wireless transmitters - including in schools, hospitals, public transport, and libraries.

In July, the Spanish Court of Madrid pronounced a former telecoms engineer permanently disabled by EHS. Meanwhile an appeal judge (UK) awarded Employment and Support Allowance to a claimant, using surrogate terms due to the lack of legal recognition of EHS.

ICNIRP, the controversial regulatory body with newly documented conflicts of interest, now held 5 of the 6 seats in the WHO's core group on EMFs (2016). As early as 2000, in a 189-page report, environmental professor Neil Cherry concluded ICNIRP neglected evidence *"that would have had a chemical declared carcinogenic, neuropathogenic, cardiogenic and teratogenic for humans many years ago."*

Though views would vary widely, by October 2016, 223 EMF scientists from 41 nations had signed the ongoing appeal to the WHO and UN for new safety standards.

The UK's microwave smart-meter rollout lumbered forward, despite spiraling costs, overseas court claims for health damage, and scientists' call for worldwide, non-toxic alternatives. TV adverts obscured the meters' microwave spikes (downplayed by manufacturers) and research on emerging health risks. *(See note.)*

Installation began to take off in London's tenanted accommodation. Mel Kelly, reprinted in *The Ecologist*, had already pointed out that many poorer households (tenants) would face involuntary metering and exposure.

The interaction of toxic chemicals and electromagnetic fields continued to be neglected. The discovery of EMF-sensitive magnetite in the brain from chemical air pollution (September) did not bode well. Nor did the earlier discovery that weak wireless exposure speeded up rodent body tumors triggered by a chemical carcinogen (Lerchl 2015).

Apple launched its wireless 'earbuds', which expose the brain to Bluetooth, just as Professor Pall (winner of eight international awards) published a new paper on wireless risks to our nervous systems and brains (September).

This followed his ground-breaking work on a 'master mechanism' of harm: 26 peer-reviewed papers revealed over-stimulation of electrical gates (VGCCs) in our cell walls. This process boosts production of

peroxynitrite *(see note)* - one of the most toxic compounds in the body - an emerging disease risk factor which triggers free radical damage to cells, tissues, mitochondria, and DNA.

Noting 93 papers showing free radical damage from low-level wireless radiation, Yakymenko, et al 2016 concluded it has *"a high pathogenic potential"*. Associate Professor Havas (November 2016) drew a similar, insightful parallel with weakly ionizing radiation such as X-rays or low energy gamma rays of nuclear origin.

Overall, 2016's precautionary findings, added to the accumulating data suggesting bio-risks, raise sensitive questions. Are we placing a covert stress, perhaps, on our exposed trees and pollinators? Could we be failing to safeguard children, teenagers, and those in frail health? What is the growing carbon cost of global, ever-on transmitters?

And as time passes, might profit-driven trends for microwave 'smart homes', crammed with devices plus micro-transmitters (IoT), risk a subtle 'sick building syndrome', to everyone's hidden cost? Our care for humanity, and the delicate legacy of DNA, invites us to reflect on such questions.

Can we take inspiration from Krakow, and the French Green law on EMFs? As 2017 unfolds, it seems clean ways forward deserve new thought, alongside creative steps for low-addiction living - a vital complement to going low carbon.

http://www.theecologist.org/News/news_analysis/2988521/krakows_bold_step_to_curb_electromagnetic_pollution_reflects_growing_evidence_of_harm.html

The effects of radiofrequency electromagnetic radiation on sperm function

Abstract

Mobile phone usage has become an integral part of our lives. However, the effects of the radiofrequency electromagnetic radiation (RF-EMR) emitted by these devices on biological systems and specifically the reproductive systems are currently under active debate. A fundamental hindrance to the current debate is that there is no clear mechanism of how such non-ionising radiation influences biological systems. Therefore, we explored the documented impacts of RF-EMR on the male reproductive system and considered any common observations that could provide insights on a potential mechanism. Among a total of 27 studies investigating the effects of RF-EMR on the male reproductive system, negative consequences of exposure were reported in 21. Within these 21 studies, 11 of the 15 that investigated sperm motility reported significant declines, 7 of 7 that measured the production of reactive oxygen species documented elevated levels and 4 of 5 studies that probed for DNA damage highlighted increased damage, due to RF-EMR exposure. Associated with this, RF-EMR treatment reduced antioxidant levels in 6 of 6 studies that studied this phenomenon, while consequences of RF-EMR were successfully ameliorated with the supplementation of antioxidants in all 3 studies that carried out these experiments. In light of this, we envisage a two-step mechanism whereby RF-EMR is able to induce mitochondrial dysfunction leading to elevated ROS production. A continued focus on research which aims to shed light on the biological effects of RF-EMR will allow us to test and assess this proposed mechanism in a variety of cell types.

http://www.reproduction-online.org/content/early/2016/09/06/REP-16-0126

Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression

Abstract

Non-thermal microwave/lower frequency electromagnetic fields (EMFs) act via voltage-gated calcium channel (VGCC) activation. Calcium channel blockers block EMF effects and several types of additional evidence confirm this mechanism. Low intensity microwave EMFs have been proposed to produce neuropsychiatric effects, sometimes called microwave syndrome, and the focus of this review is whether these are indeed well documented and consistent with the known mechanism(s) of action of such EMFs. VGCCs occur in very high densities throughout the nervous system and have near universal roles in release of neurotransmitters and neuroendocrine hormones. Soviet and Western literature shows that much of the impact of non-thermal microwave exposures in experimental animals occurs in the brain and peripheral nervous system, such that nervous system histology and function show diverse and substantial changes. These may be generated through roles of VGCC activation, producing excessive neurotransmitter/neuroendocrine release as well as oxidative/nitrosative stress and other responses. Excessive VGCC activity has been shown from genetic polymorphism studies to have roles in producing neuropsychiatric changes in humans. Two U.S. government reports from the 1970s to 1980s provide evidence for many neuropsychiatric effects of non-thermal microwave EMFs, based on occupational exposure studies. 18 more recent epidemiological studies, provide substantial evidence that microwave EMFs from cell/mobile phone base stations, excessive cell/mobile phone usage and from wireless smart meters can each produce similar patterns of neuropsychiatric effects, with several of these studies showing clear dose–response relationships. Lesser evidence from 6 additional studies suggests that short wave, radio station, occupational and digital TV antenna exposures may produce similar neuropsychiatric effects. Among the more commonly reported changes are sleep disturbance/insomnia, headache, depression/depressive symptoms, fatigue/tiredness, dysesthesia, concentration/attention dysfunction, memory changes, dizziness, irritability, loss of appetite/body weight, restlessness/anxiety, nausea, skin burning/tingling/dermographism and EEG changes. In summary, then, the mechanism of action of microwave EMFs, the role of the VGCCs in the brain, the impact of non-thermal EMFs on the brain, extensive epidemiological studies performed over the past 50 years, and five criteria testing for causality, all collectively show that various non-thermal microwave EMF exposures produce diverse neuropsychiatric effects.

http://www.sciencedirect.com/science/article/pii/S0891061815000599

The alteration of spontaneous low frequency oscillations caused by acute electromagnetic fields exposure

Abstract

OBJECTIVE:
The motivation of this study is to evaluate the possible alteration of regional resting state brain activity induced by the acute radiofrequency electromagnetic field (RF-EMF) exposure (30min) of Long Term Evolution (LTE) signal.

METHODS:
We designed a controllable near-field LTE RF-EMF exposure environment. Eighteen subjects participated in a double-blind, crossover, randomized and counterbalanced experiment including two sessions (real and sham exposure). The radiation source was close to the right ear. Then the resting state fMRI signals of human brain were collected before and after the exposure in both sessions. We measured the amplitude of low frequency fluctuation (ALFF) and fractional ALFF (fALFF) to characterize the spontaneous brain activity.

RESULTS:
We found the decreased ALFF value around in left superior temporal gyrus, left middle temporal gyrus, right superior temporal gyrus, right medial frontal gyrus and right paracentral lobule after the real exposure. And the decreased fALFF value was also detected in right medial frontal gyrus and right paracentral lobule.

CONCLUSIONS:
The study provided the evidences that 30min LTE RF-EMF exposure modulated the spontaneous low frequency fluctuations in some brain regions.

SIGNIFICANCE:
With resting state fMRI, we found the alteration of spontaneous low frequency fluctuations induced by the acute LTE RF-EMF exposure.

https://www.ncbi.nlm.nih.gov/pubmed/24012322

Additive Effects of Millimeter Waves and 2-Deoxyglucose Co-Exposure on the Human Keratinocyte Transcriptome

Abstract

Millimeter Waves (MMW) will be used in the next-generation of high-speed wireless technologies, especially in future Ultra-Broadband small cells in 5G cellular networks. Therefore, their biocompatibilities must be evaluated prior to their massive deployment. Using a microarray-based approach, we analyzed modifications to the whole genome of a human keratinocyte model that was exposed at 60.4 GHz-MMW at an incident power density (IPD) of 20 mW/cm^2 for 3 hours in athermic conditions. No keratinocyte transcriptome modifications were observed. We tested the effects of MMWs on cell metabolism by co-treating MMW-exposed cells with a glycolysis inhibitor, 2-deoxyglucose (2dG, 20 mM for 3 hours), and whole genome expression was evaluated along with the ATP content. We found that the 2dG treatment decreased the cellular ATP content and induced a high modification in the transcriptome (632 coding genes). The affected genes were associated with transcriptional repression, cellular communication and endoplasmic reticulum homeostasis. The MMW/2dG co-treatment did not alter the keratinocyte ATP content, but it did slightly alter the transcriptome, which reflected the capacity of MMW to interfere with the bioenergetic stress response. The RT-PCR-based validation confirmed 6 MMW-sensitive genes (SOCS3, SPRY2, TRIB1, FAM46A, CSRNP1 and PPP1R15A) during the 2dG treatment. These 6 genes encoded transcription factors or inhibitors of cytokine pathways, which raised questions regarding the potential impact of long-term or chronic MMW exposure on metabolically stressed cells.

https://www.ncbi.nlm.nih.gov/pubmed/27529420

Transcriptome Analysis Reveals the Contribution of Thermal and the Specific Effects in Cellular Response to Millimeter Wave Exposure

Abstract

Radiofrequency radiations constitute a new form of environmental pollution. Among them, millimeter waves (MMW) will be widely used in the near future for high speed communication systems. This study aimed therefore to evaluate the biocompatibility of MMW at 60 GHz. For this purpose, we used a whole gene expression approach to assess the effect of acute 60 GHz exposure on primary cultures of human keratinocytes. Controls were performed to dissociate the electromagnetic from the thermal effect of MMW. Microarray data were validated by RT-PCR, in order to ensure the reproducibility of the results. MMW exposure at 20 mW/cm^2, corresponding to the maximum incident power density authorized for public use (local exposure averaged over 1 cm^2), led to an increase of temperature and to a strong modification of keratinocyte gene expression (665 genes differentially expressed). Nevertheless, when temperature is artificially maintained constant, no modification in gene expression was observed after MMW exposure. However, a heat shock control did not mimic exactly the MMW effect, suggesting a slight but specific electromagnetic effect under hyperthermia conditions (34 genes differentially expressed). By RT-PCR, we analyzed the time course of the transcriptomic response and 7 genes have been validated as differentially expressed: ADAMTS6, NOG, IL7R, FADD, JUNB, SNAI2 and HIST1H1A. Our data evidenced a specific electromagnetic effect of MMW, which is associated to the cellular response to hyperthermia. This study raises the question of co-exposures associating radiofrequencies and other environmental sources of cellular stress.

Results

Comparison between Sham and MMW exposed cells

The global gene expression change between the 60-GHz exposed cells at 20 mW/cm^2 (Expo) and unexposed cells (Sham) evidenced 789 differentially expressed probes with a fold change above 2 (Table 1 and Table S2 in File S1). This probe list included 665 annotated coding genes and 51 long intergenic non-coding RNAs (lincRNA). Among the coding genes, 366 (55%) were down-regulated (Expo <Sham) and 299 (45%) were up-regulated (Expo> Sham). It should be noted that when the microarray analysis is done with an absolute fold change filtered at 1.5, then 1172 probes were found to be differentially expressed (Table 1). Functional enrichments were performed using the DAVID software (David version 6.7; http://david.abcc.ncifcrf.gov/). Biological categories were considered enriched for a corrected p-value below 0.05. The main biological categories associated with these differentially expressed genes were chaperone and heat shock (Figure 2), which is consistent with the heat shock effect of MMW exposure in our conditions. Indeed, under this IPD exposure, the temperature in the cell medium is increased by 6.7°C (Figure 1). In fact, this differentially expressed gene list evidenced two main impacts of the MMW exposure on the cell (Figure 2). The first one is the response to unfolded protein that is a well-known consequence of the temperature increase. The second effect is the negative regulation of the gene expression that is illustrated by an increase in the expression of genes implicated in the negative regulation, and by the down regulation of most differentially expressed genes.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4193780/

Thermal mechanisms of millimeter wave stimulation of excitable cells

Abstract

Interactions between millimeter waves (MMWs) and biological systems have received increasing attention due to the growing use of MMW radiation in technologies ranging from experimental medical devices to telecommunications and airport security. Studies have shown that MMW exposure alters cellular function, especially in neurons and muscles. However, the biophysical mechanisms underlying such effects are still poorly understood. Due to the high aqueous absorbance of MMW, thermal mechanisms are likely. However, nonthermal mechanisms based on resonance effects have also been postulated. We studied MMW stimulation in a simplified preparation comprising Xenopus laevis oocytes expressing proteins that underlie membrane excitability. Using electrophysiological recordings simultaneously with 60 GHz stimulation, we observed changes in the kinetics and activity levels of voltage-gated potassium and sodium channels and a sodium-potassium pump that are consistent with a thermal mechanism. Furthermore, we showed that MMW stimulation significantly increased the action potential firing rate in oocytes coexpressing voltage-gated sodium and potassium channels, as predicted by thermal terms in the Hodgkin-Huxley model of neurons. Our results suggest that MMW stimulation produces significant thermally mediated effects on excitable cells via basic thermodynamic mechanisms that must be taken into account in the study and use of MMW radiation in biological systems.

https://www.ncbi.nlm.nih.gov/pubmed/23790370

Low power radio-frequency and microwave effects on human electroencephalogram and behavior

Abstract

In a pilot study of ten human subjects, temporary changes in brain waves and behavior were seen on exposure to power densities lower than 10(-12) W/cm^2, which is substantially below typical urban levels. Frequencies included .1 to 960 MHz continuous and 8.5 to 9.6 GHz pulse-modulated waves. Since the relaxation frequency of protein-bound water is considered to fall between 100 and 1,000 MHz, absorptions and quantum effects may be the mechanistic basis for the electroencephalogram changes observed in most of the subjects produced by 10(-15) W/cm^2 cw radio-frequency energy of between 130 and 960 MHz. Constructive and destructive interference patterns from standing waves within the skull possibly interact with the bioelectric generators in the brain, since electroencephalogram wave amplitudes and frequencies increased or decreased respectively at different radio wavelengths.

https://www.ncbi.nlm.nih.gov/pubmed/751078

Millimeter wave absorption in the nonhuman primate eye at 35 GHz and 94 GHz

Abstract

The purpose of this study was to evaluate anterior segment bioeffects of pulsed 35 GHz and 94 GHz microwave exposure in the nonhuman primate eye. Five juvenile rhesus monkeys (Macaca mulatta) underwent baseline anterior segment ocular assessment consisting of slit lamp examination, corneal topography, specular microscopy, and pachymetry. These studies were repeated after exposure of one eye to pulsed 35 GHz or 94 GHz microwaves at varied fluences, with the other eye serving as a control. The mean fluence required to produce a threshold corneal lesion (faint epithelial edema and fluorescein staining) was 7.5 J cm(-2) at 35 GHz and 5 J cm(-2) at 94 GHz. Transient changes in corneal topography and pachymetry were noted at these fluences. Endothelial cell counts remained unchanged. Threshold corneal injury from 35 GHz and 94 GHz microwave exposure is produced at fluences below those previously reported for CO2 laser radiation. These data may help elucidate the mechanism of thermal injury to the cornea, and resolve discrepancies between IEEE C95.1 (1999), NCRP (1986), and ICNIRP (1998) safety standards for exposure to non-ionizing radiation at millimeter wavelengths.

https://www.ncbi.nlm.nih.gov/pubmed/12075687

Increased sensitivity of the non-human primate eye to microwave radiation following ophthalmic drug pretreatment

Abstract

Previous studies in our laboratory have established that pulsed microwaves at 2.45 GHz and 10 mW/cm^2 are associated with production of corneal endothelial lesions and with disruption of the blood-aqueous barrier in the non-human primate eye. In the study reported here we examined ocular damage in monkeys (M. mulatta and M. fascicularis) following topical treatment with one of two ophthalmic drugs (timolol maleate and pilocarpine) that preceded exposure to pulsed microwaves. Anesthetized monkeys were sham exposed or exposed to pulsed, 2.45 GHz microwaves (10 microseconds, 100 pps) at average power densities of 0.2, 1, 5, 10, or 15 mW/cm^2 4 h a day for 3 consecutive days (respective SARs were 0.052, 0.26, 1.3, 2.6, and 3.9 W/kg). Immediately before microwave exposure, one or both eyes were treated topically with one drop of 0.5% timolol maleate or of 2% pilocarpine. Following administration of a drug, we observed a significant reduction in the power-density threshold (from 10 to 1 mW/cm^2) for induction of corneal endothelial lesions and for increased vascular permeability of the iris. Diagnostic procedures (in vivo specular microscopy and fluorescein iris angiography) were performed following each exposure protocol. In addition, increased vascular permeability was confirmed with horseradish peroxidase tracer techniques. Although we did not measure intraocular temperatures in experimental animals, the results suggest that a mechanism other than significant heating of the eye is involved. Our data indicate that pulsed microwaves at an average SAR of 0.26 W/kg, if administered after pretreatment with ophthalmic drugs, can produce significant ocular effects in the anesthetized primate.

https://www.ncbi.nlm.nih.gov/pubmed/1445419

Effects of low-intensity extremely high frequency electromagnetic radiation on chromatin structure of lymphoid cells in vivo and in vitro

Abstract

Using a comet assay technique, it was shown for the first time that low-intensity extremely high-frequency electromagnetic radiation (EHF EMR) in vivo causes oppositely directed effects on spatial organization of chromatin in cells of lymphoid organs. In 3 hrs after single whole-body exposure of NMRI mice for 20 min at 42.0 GHz and 0.15 mW/cm^2, an increase by 16% ($p < 0.03$ as compared with control) and a decrease by 16% ($p < 0.001$) in fluorescence intensity of nucleoids stained with ethidium bromide were found in thymocytes and splenocytes, respectively. The fluorescence intensity of stained nucleoids in peripheral blood leukocytes was not changed after the exposure. The exposure of cells of Raji hunan lymphoid line and peripheral blood leukocytes to the EHF EMR in vitro induced a decrease in fluorescence intensity by 23% ($p < 0.001$) and 18% ($p < 0.05$), respectively. These effects can be determined by changes in a number of physiological alkali-labile sites in DNA of exposed cells. We suggested that the effects of low-intensity EHF EMR on the immune system cells are realized with the participation of neuroendocrine and central nervous systems.

https://www.ncbi.nlm.nih.gov/pubmed/12677665

Suppression of nonspecific resistance of the body under the effect of extremely high frequency electromagnetic radiation of low intensity

Abstract

The dynamics of leukocyte number and functional activity of peripheral blood neutrophils under whole-body exposure of healthy mice to low-intensity extremely-high-frequency electromagnetic radiation (EHF EMR, 42.0 GHz, 0.15 mW/cm^2, 20 min daily) was studied. It was shown that the phagocytic activity of peripheral blood neutrophils was suppressed by about 50% ($p < 0.01$ as compared with the sham-exposed control) in 2-3 h after the single exposure to EHF EMR. The effect persisted for 1 day after the exposure, and then the phagocytic activity of neutrophils returned to the norm within 3 days. A significant modification of the leukocyte blood profile in mice exposed to EHF EMR for 5 days was observed after the cessation of exposures: the number of leukocytes increased by 44% ($p < 0.05$ as compared with sham-exposed animals), mostly due to an increase in the lymphocyte content. The supposition was made that EHF EMR effects can be mediated via the metabolic systems of arachidonic acid and the stimulation of adenylate cyclase activity, with subsequent increase in the intracellular cAMP level. The results indicated that the whole-body exposure of healthy mice to low-intensity EHF EMR has a profound effect on the indices of nonspecific immunity.

https://www.ncbi.nlm.nih.gov/pubmed/11855293

Effects of millimeter wave on gene expression in human keratinocytes

Abstract

OBJECTIVE:
To explore the effect of millimeter wave exposure at low power density on gene expression in human keratinocytes (HaCaT).

METHODS:
HaCaT keratinocytes were exposed to 30.16 GHz millimeter wave with power densities of 1.0 or 3.5 mW/cm^2 for 30 min per day. Gene expression profiles were obtained using the Affymetrix human genome U95A GeneChip. Reverse-transcription polymerase chain reaction (RT-PCR) was performed to confirm the differential expression of genes obtained from Genechip analysis.

RESULT:
PAR-2 and ERGIC-53 genes in HaCaT cells were up-regulated by 3.5 mW/cm^2 millimeter wave exposure for 4 times. ERGIC-53 gene was also up-regulated by 1.0 mW/cm^2 millimeter wave exposure for 4 times. However, no significant change for PAR-2 expression was found after the same exposure.

CONCLUSION:
Millimeter wave exposure could affect gene expression in human keratinocytes, which might be related to the intensity and the times of exposure.

https://www.ncbi.nlm.nih.gov/pubmed/18275115

Low power radio-frequency and microwave effects on human electroencephalogram and behavior

Abstract

In a pilot study of ten human subjects, temporary changes in brain waves and behavior were seen on exposure to power densities lower than 10(-12) W/cm^2, which is substantially below typical urban levels. Frequencies included .1 to 960 MHz continuous and 8.5 to 9.6 GHz pulse-modulated waves. Since the relaxation frequency of protein-bound water is considered to fall between 100 and 1,000 MHz, absorptions and quantum effects may be the mechanistic basis for the electroencephalogram changes observed in most of the subjects produced by 10(-15) W/cm^2 cw radio-frequency energy of between 130 and 960 MHz. Constructive and destructive interference patterns from standing waves within the skull possibly interact with the bioelectric generators in the brain, since electroencephalogram wave amplitudes and frequencies increased or decreased respectively at different radio wavelengths.

https://www.ncbi.nlm.nih.gov/pubmed/751078

Impact of 60-GHz millimeter waves and corresponding heat effect on endoplasmic reticulum stress sensor gene expression

Abstract

Emerging high data rate wireless communication systems, currently under development, will operate at millimeter waves (MMW) and specifically in the 60 GHz band for broadband short-range communications. The aim of this study was to investigate potential effects of MMW radiation on the cellular endoplasmic reticulum (ER) stress. Human skin cell lines were exposed at 60.4 GHz, with incident power densities (IPD) ranging between 1 and 20 mW/cm(2) . The upper IPD limits correspond to the ICNIRP local exposure limit for the general public. The expression of ER-stress sensors, namely BIP and ORP150, was then examined by real-time RT-PCR. Our experimental data demonstrated that MMW radiations do not change BIP or ORP150 mRNA basal levels, whatever the cell line, the exposure duration or the IPD level. Co-exposure to the well-known ER-stress inducer thapsigargin (TG) and MMW were then assessed. Our results show that MMW exposure at 20 mW/cm(2) inhibits TG-induced BIP and ORP150 over expression. Experimental controls showed that this inhibition is linked to the thermal effect resulting from the MMW exposure.

https://www.ncbi.nlm.nih.gov/pubmed/25099539

Experimental studies on the influence of millimeter radiation on light transmission through the lens

Abstract

The influence of microwave radiation in millimeter range on the eye has not been investigated so far. However, it is known that microwaves of different wave-length can induce the development of the cataract. Therefore the purpose of the study was to investigate light transmission through the lens after exposure to microwave radiation in millimeter range. The studies were carried out on 22 rats exposed to microwave radiation of 5.6 mm length and power per unit area 10 mW/cm^2 or 1 mW/cm^2 during 58 days. Light transmission through the isolated lenses was measured spectrophotometrically. Transmission through the lenses was significantly decreased (about 33%) in the rats exposed to microwave radiation of 10 mW/cm^2. The results of the study indicate that also microwave radiation in millimeter range can induce changes in the lens, predisposing to cataract development.

https://www.ncbi.nlm.nih.gov/pubmed/7897988

Changes in gap junctional intercellular communication in rabbits lens epithelial cells induced by low power density microwave radiation

Abstract

OBJECTIVE:
To demonstrate the changes in gap junctional intercellular communication (GJIC) mediated by low power density microwave radiation in rabbits lens epithelial cells (LECs) and its mechanisms.

METHODS:
Rabbits' eyes were exposed to 5 mW/cm(2) and 10 mW/cm(2) power densities of microwave radiation for 3 hours. The fluorescence-recovery-after-photobleaching (FRAP) method was used to determine the GJIC. The localization and function of connexin 43 in LECs was detected by laser scanning confocal microscopy.

RESULTS:
The GJIC of rabbits LECs was inhibited by microwave radiation especially in the 10 mW/cm(2) irradiated samples. A decrease in connexin 43-positive staining was seen in 5 mW/cm(2) x 3 h treated LECs. Intracellular space accumulation and cytoplasmic internalization were clearly demonstrated in 10 mW/cm(2) group.

CONCLUSIONS:
Low power densities microwave radiation (5 mW/cm(2) and 10 mW/cm(2)) induces damage to connexin 43 and inhibits the GJIC of rabbits LECs. These changes result in an osmotic imbalance within the lens and induce early cataract. 5 mW/cm(2) or 10 mW/cm(2) microwave radiation is cataractogenic.

https://www.ncbi.nlm.nih.gov/pubmed/12622942

The Neuroinflammatory Etiopathology of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)

Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is a debilitating multi-systemic chronic illness of unknown etiology, classified as a neurological disorder by the World Health Organization (WHO). The symptomatology of the condition appears to emanate from a variety of sources of chronic neurological disturbance and associated distortions, and chronicity, in noxious sensory signaling and neuroimmune activation. This article incorporates a summary review and discussion of biomedical research considered relevant to this essential conception perspective. It is intended to provide stakeholders with a concise, integrated outline disease model in order to help demystify this major public health problem. The primary etiopathological factors presented are: (A) Postural/biomechanical pain signaling, affecting adverse neuroexcitation, in the context of compression, constriction, strain, or damage of vertebral-regional bone and neuromuscular tissues; (B) Immune mediated inflammatory sequelae, in the context of prolonged immunotropic neurotrophic infection—with lymphotropic/gliotropic/glio-toxic varieties implicated in particular; (C) A combination of factors A and B. Sustained glial activation under such conditions is associated with oxidative and nitrosative stress, neuroinflammation, and neural sensitivity. These processes collectively enhance the potential for multi-systemic disarray involving endocrine pathway aberration, immune and mitochondrial dysfunction, and neurodegeneration, and tend toward still more intractable synergistic neuro-glial dysfunction (gliopathy), autoimmunity, and central neuronal sensitization.

Nociceptive afferent input excites post-synaptic neurons and may also be read by glia, triggering cellular responses e.g., via the stimulated neuronal release of chemical mediators that bind to glial receptors (Ren and Dubner, 2008). Calcium ion (Ca(2+)) influx into astrocytes following stimulation causes central terminals of the nociceptor to release a host of neuroactive signal molecules. These include the primary neuroexcitatory neurotransmitter, glutamate, nitric oxide (NO), and pro-inflammatory cytokines: Tumor necrosis factor alpha (TNF-α) and interleukin-1 beta (IL-1β) (Ricci et al., 2009).

Activated microglia behave similarly in responding to immune challenge/inflammation (Renno et al., 1995), also inducing superoxide production. Superoxide and NO are free radical substrates of the potent, toxic oxidant peroxynitrite (ONOO–), and hence sources of oxidative and nitrosative (O+NS) damage, both individually and, particularly, when combined (Barger et al., 2007). Along with the abovementioned stimuli, glia may also be primed to respond more harshly by exposure to toxins and electromagnetic fields (EMF), including non-ionizing, radio frequency (RFR) electromagnetic radiation (EMR) (Hao et al., 2010), autoimmune processes (Colton, 2009), and the effects of aging (Norden and Godbout, 2012).

http://journal.frontiersin.org/article/10.3389/fphys.2017.00088/full

EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses

Abstract

Chronic diseases and illnesses associated with non-specific symptoms are on the rise. In addition to chronic stress in social and work environments, physical and chemical exposures at home, at work, and during leisure activities are causal or contributing environmental stressors that deserve attention by the general practitioner as well as by all other members of the health care community. It seems necessary now to take "new exposures" like electromagnetic fields (EMF) into account. Physicians are increasingly confronted with health problems from unidentified causes. Studies, empirical observations, and patient reports clearly indicate interactions between EMF exposure and health problems. Individual susceptibility and environmental factors are frequently neglected. New wireless technologies and applications have been introduced without any certainty about their health effects, raising new challenges for medicine and society. For instance, the issue of so-called non-thermal effects and potential long-term effects of low-dose exposure were scarcely investigated prior to the introduction of these technologies. Common electromagnetic field or EMF sources: Radio-frequency radiation (RF) (3 MHz to 300 GHz) is emitted from radio and TV broadcast antennas, Wi-Fi access points, routers, and clients (e.g. smartphones, tablets), cordless and mobile phones including their base stations, and Bluetooth devices. Extremely low frequency electric (ELF EF) and magnetic fields (ELF MF) (3 Hz to 3 kHz) are emitted from electrical wiring, lamps, and appliances. Very low frequency electric (VLF EF) and magnetic fields (VLF MF) (3 kHz to 3 MHz) are emitted, due to harmonic voltage and current distortions, from electrical wiring, lamps (e.g. compact fluorescent lamps), and electronic devices. On the one hand, there is strong evidence that long-term exposure to certain EMFs is a risk factor for diseases such as certain cancers, Alzheimer's disease, and male infertility. On the other hand, the emerging electromagnetic hypersensitivity (EHS) is more and more recognized by health authorities, disability administrators and case workers, politicians, as well as courts of law. We recommend treating EHS clinically as part of the group of chronic multisystem illnesses (CMI), but still recognizing that the underlying cause remains the environment. In the beginning, EHS symptoms occur only occasionally, but over time they may increase in frequency and severity. Common EHS symptoms include headaches, concentration difficulties, sleep problems, depression, a lack of energy, fatigue, and flu-like symptoms. A comprehensive medical history, which should include all symptoms and their occurrences in spatial and temporal terms and in the context of EMF exposures, is the key to making the diagnosis. The EMF exposure is usually assessed by EMF measurements at home and at work. Certain types of EMF exposure can be assessed by asking about common EMF sources. It is very important to take the individual susceptibility into account. The primary method of treatment should mainly focus on the prevention or reduction of EMF exposure, that is, reducing or eliminating all sources of high EMF exposure at home and at the workplace. The reduction of EMF exposure should also be extended to public spaces such as schools, hospitals, public transport, and libraries to enable persons with EHS an unhindered use (accessibility measure). If a detrimental EMF exposure is reduced sufficiently, the body has a chance to recover and EHS symptoms will be reduced or even disappear. Many examples have shown that such measures can prove effective. To increase the effectiveness of the treatment, the broad range of other environmental factors that contribute to the total body burden should also be addressed. Anything that supports homeostasis will increase a person's resilience against disease and thus against the adverse effects of EMF exposure. There is increasing evidence that EMF exposure has a major impact on the oxidative and nitrosative regulation capacity in affected individuals. This concept

also may explain why the level of susceptibility to EMF can change and why the range of symptoms reported in the context of EMF exposures is so large. Based on our current understanding, a treatment approach that minimizes the adverse effects of peroxynitrite – as has been increasingly used in the treatment of multisystem illnesses – works best. This EMF Guideline gives an overview of the current knowledge regarding EMF-related health risks and provides recommendations for the diagnosis, treatment and accessibility measures of EHS to improve and restore individual health outcomes as well as for the development of strategies for prevention.

https://www.degruyter.com/view/j/reveh.ahead-of-print/reveh-2016-0011/reveh-2016-0011.xml

Dirty Electricity and the Link to Cancer

The Health Hazards of EMFs

History has shown that the western world with its vested interests is slow to inform citizens about toxic agents and help protect them. The "dirty electricity" pandemic is no stranger to inaction, as were the asbestos, lead, acid rain, DDT, PCB and tobacco-smoking public health issues before it. The contention that artificially created electromagnetic fields (EMFs) which emanate from electricity generation can cause cancer has medical and legal experts commenting that EMFs will dwarf the tobacco-smoking issue and the asbestos crisis combined.

This health issue has a history replete with destroyed careers and tarnished reputations involving scientists who have sought to help the people, and with so-called experts who have colluded with the forces going against the precautionary principle of public health: first, *do no harm.*

In his assessment for the journal of the Royal Institute of Public Health in the UK, Dr Stephen J. Genuis reported that vested interests have been effective in delaying restrictive EMF legislation. He also noted that claims of environmental harm have been challenged by researchers who fail to disclose covert ties to industry, that economic interests exert undue influence on medical journals, and that some editors and journal staff have suppressed publication of scientific results that are adverse to the interests of industry.[1]

Professor Mark Ellwood, who was installed by the Australian federal government in the most elevated position in the nation as Director of the National Cancer Control Initiative to provide advice and make recommendations to the government and other key groups regarding cancer control, submitted expert witness reports for the power companies (and telecommunications companies) for court cases. Professor Andrew Wood, installed by the federal government in another position that serves to protect us—ARPANSA, the Australian Radiation Protection and Nuclear Safety Administration—also submits expert witness reports for the power industry for court cases. Professor Wood is currently chair of the ELF (extremely low frequency) Standard Working Group for the ARPANSA Radiation Health Committee.

It was not until 1979 that the western world took notice that these silent, invisible EMFs may be hazardous. Epidemiologist Dr Nancy Wertheimer and electrical engineer Ed Leeper conducted a study in Denver, Colorado, USA, and reported that children who were twice or three times as likely to have leukaemia tended to live in homes close to power lines and transformers. Their results, published in a scientific paper, showed an increased incidence of leukaemia, lymphomas and nervous system tumours in children.[2]

Their hotly debated research had an immediate effect: in response to public opposition to the construction of new high-voltage power lines, the electricity industry convened an expert panel of eminent and conservative medical scientists.

Included in this panel was Professor David Carpenter, from the Department of Public Health at New York University, and Dr David Savitz, one of America's most respected epidemiologists. Professor Carpenter's original scepticism was overturned when the Wertheimer and Leeper study, originally heavily criticised as flawed, was extended and improved. It confirmed a significantly increased risk of leukaemia.[3]

The reason why childhood leukaemia is studied is because the strongest evidence for a cancer is that the same cancer is significantly elevated in children.

In 2001, leading occupational medical epidemiologist Dr Sam Milham, MPH, and E. M. Ossiander, of the Washington State Department of Health, Olympia, researched the rise of electrification in the UK and USA and concluded that the childhood leukaemia peak of common acute lymphoblastic leukaemia was attributable to residential electrification: 75 per cent of all childhood acute lymphoplastic leukaemia and 60 per cent of all childhood leukaemia could be preventable.[4] In 2007, Professor Michael Kundi reported that up to 80 per cent of all cases of childhood leukaemia may be caused by exposure to these fields.[5]

It was reported as early as the 1960s (Court-Brown and Doll) that a new leukaemia-causing agent entered the UK and USA in the 1920s-1930s.6 Today it is quite widely accepted that these EMFs can cause childhood leukaemia.

There is some evidence that other childhood cancers may be related to EMF exposure, but not enough studies have been done.[7]

Wertheimer and Leeper were the first to see a magnetic field-breast cancer connection in their 1982 study of residential magnetic field exposures of adults.8 Even though this study looked at overall cancer risk in adults and found an increase in excess cancers of the nervous system, uterus and lymphoid tumours, "they discovered a nearly threefold increase among women younger than 55 who lived near power lines, indicating that magnetic field exposure had accelerated, development and growth of breast cancer".[9]

Breast tissue (along with foetal tissue) is the most sensitive tissue in the body and also the most sensitive to artificial (man-made) radiation, which is why any study into breast cancer has significant ramifications for all of us.

Breast cancer is a very-high-risk disease for women today. The contention that EMFs are a risk factor, let alone a *causative* factor, in female breast cancer has been heavily resisted. When individual cases of breast cancer or breast cancer clusters in women occur, various reproductive factors are also taken into account which can mask the role that EMFs play.

When, in 2001, three men in one small office developed breast cancer, Dr Sam Milham testified for the men in their 2003 court case, arguing that their cancers were caused, in part at least, by EMFs emanating from an electrical vault next to a basement office where the men worked.[10] In 1997, Dr Thomas Erren, MPH, had noted that an association between ELF EMFs and breast cancer is supported in men.[11]

In 2002, even the Washington, DC, legal counsel for electricity utilities worldwide conceded in a privileged attorney-client communication that the stance of the power industry had to change.[12] Studies are normally conducted on exposed and unexposed subjects, but with these EMFs we are all exposed, making a definitive cause hard to prove.

Also, it would be unethical to expose people to high measurements of these EMFs to prove the case. People don't welcome having to change convenient lifestyles, and, when doubt and confusion are introduced, the public is often quick to disregard the importance of data that makes changing ingrained habits a requirement.

There have been thousands of studies of EMFs, more so than with any other health issue. In 1997, Dr Erren commented that there are more epidemiological studies that link cancer to these fields than to environmental tobacco smoke.[13] We are all concerned about the infiltration of chemicals into our wider and more personal environments, yet an analysis of 65 studies reported that the combined effects of toxic agents together with EMFs enhance the damage as compared to the toxic exposure alone.[14]

In 2007, the World Health Organization (WHO) stated that it is "reasonable and warranted" to lessen exposure to these ELF EMFs, "(provided that the health, social and economic benefits of electric power are not compromised"[15]—information that will take decades to be acted upon around the globe.

EMFs and Cancer Clusters

Fifty-three people in a small post office in Capalaba, Brisbane, Australia, with an old electricity substation next door, were diagnosed with serious and fatal diseases by 2000, although staff had started to take notice of the disease patterns in the early 1990s. Investigation of the electrical environment was incomplete, and there is still no resolution to this situation today.

When research is conducted into these disease clusters, often it's the case that measurements are taken after hours when the electrical environment has changed or that investigations are conducted after extensive remedial electrical work has been completed. Often the cancers are put down to "random chance" or "coincidence".

However, in the case of the breast cancer cluster involving 17 women working in a small area within the Australian Broadcasting Corporation (ABC) TV studios in Toowong, Brisbane, the cancers, which were diagnosed between 1995 and 2006, were thought to be workplace-related but no cause could be found. In early 2005, the women pinpointed the area which they thought was in question.

A private firm, EMC Technologies, took radio-frequency electromagnetic radiation measurements in April 2005 and concluded that all the work areas surveyed complied with the ARPANSA RPS3 standard,[16] but it wasn't until 18 December 2006 that ARPANSA investigated the premises for ELF EMFs. Within three days, the ABC staff were no longer working on the premises.

The specific measurements of ELF EMFs in the area pinpointed by the staff were not mentioned in the ARPANSA report.[17] Complete and precise measurements of ELF EMFs as well as transient EMFs should have been taken in the area.

Professor Bruce Armstrong led the ABC's own investigation into the cancer cluster in 2006, looking at other breast cancer risk factors such as reproductive, lifestyle and age factors.

When questioned on national television in August 2007 on this breast cancer cluster and the frustration of some of the women who felt that the proper investigations were not carried out before all the equipment was taken out, he stated: "It is very important to do the investigations properly, and indeed we did have a problem with the ABC with the fairly quick decision to remove people from the site.

It did mean that some of the measurements we wanted to do were not complete, and I do understand how the women feel in that respect; they don't feel that it's been done satisfactorily..."[18]

This breast cancer cluster came close to showing the world that EMFs can cause breast cancer. Even though further analysis was not conducted on male staff in this workplace, the possibility does exist that prostate and/or testicular cancers may have been present or may develop in the future.

If complete measurements of all aspects of the electrical environment had been taken, this could have been a win-win situation for all citizens of the world: the women could have known what caused their breast cancer and (along with every other woman and man) would have been able to ensure that their next working environment was safe; ABC TV would have been the perfect medium to spread the much-awaited information across the globe; and the ABC itself would have been commended on its groundbreaking achievement in helping millions of people (and scientists) throughout the world understand EMFs more fully. It also could have enabled the process of workplace reform to be instigated.

These cancer clusters serve to show us what is happening silently on a daily basis in everyone's lives. The adults and children of today have already been affected by these EMFs. Miscarriage, stillbirth, pre-term delivery, altered gender ratio and congenital abnormalities have been linked to maternal exposure.[19] Testicular abnormalities, atypical sperm, chromosomal aberrations and offspring congenital defects have all been linked to paternal exposure.[20] Fathers employed in industries with higher than average EMF exposure have also been noted to have offspring with higher rates of brain and spinal cord tumours.[21]

The Perils of Dirty Electricity

Any harmful EMFs can be classed as "dirty"—to put into common idiom the scientific and technical language that accompanies this public health issue— yet there is another facet of electricity, termed "dirty electricity", that is now seen as even more of a threat to our health than the electromagnetic fields mentioned above. It is not only the fields from power lines and substations that can be a concern; dirty electricity is running through virtually every building on the planet. An even more prevalent and insidious agent, this secretive and subtle underlying menace is in all probability one cause of the dramatic increase in many illnesses and cancers.

Dr Sam Milham stated in 2008: "Very recently, new research is suggesting that nearly all the human plagues which emerged in the twentieth century, like common acute lymphoblastic leukemia in children, female breast cancer, malignant melanoma and asthma, can be tied to some facet of our use of electricity.

There is an urgent need for governments and individuals to take steps to minimize community and personal EMF exposures."[22]

In 1994, the B Armstrong et al. study relating to dirty electricity was published.[23] However, it was not until 2005, when Dr Sam Milham and electrical engineer Lloyd Morgan came out of retirement due to their concern over a cancer cluster, that information worthy of creating a paradigm shift finally began to emerge, with the results having serious implications for all of us.

(These brave researchers had honourable intentions and impressive credentials.[24] Dr Sam Milham in 1982 was the first to link workers exposed to EMFs with higher rates of leukaemia. Lloyd Morgan, a brain tumour survivor and a director of the Central Brain Tumor Registry of the United States (CBTRUS), introduced the Benign Brain Tumor Registries Amendment Act into US Congress that became law in

2002. Along with breast cancer, leukaemia and diseases of the central nervous system, brain tumours are among the diseases that are more prominent in this health issue.)

The researchers were responding to alarm over a cluster of 18 cancers reported in 2003 among the 137 teachers at a middle school in California. Even though the school district administration had refused a number of requests for these men to assist in the evaluation of this cluster, which involved nearly three times more cancers than the average, one teacher invited these researchers to visit the school after hours to take measurements of the electrical environment, which they did at their own expense. When the researchers reported their findings to the Superintendent of Schools, Dr Milham was threatened with prosecution for "unlawful...trespass" and the teacher who had invited them into the school received a letter of reprimand. The teachers then filed a California OSHA (Occupational Safety Health Administration) complaint, which ultimately led to the progressive California Department of Health Services (CDHS) becoming involved. The CDHS measured the different facets of the electrical environment and provided Milham and Morgan with the data, which showed that dirty electricity—"transients", which are radio-frequencies riding along electrical wiring—was involved. Finally, this was a study that was conducted with the highest integrity, able to break through the red tape and politics that usually accompany the problem of harmful electrical environments. Of immense importance, Milham and Morgan commented that transients may be a universal carcinogen similar to ionising radiation,[25] an already established cause of cancer.

The only two published studies relating to dirty electricity—Armstrong *et al.* 1994 study and the Milham-Morgan study—both show very positive increases in cancer risk with increasing *cumulative* exposure to transients.

What is of critical importance is that the cancer risks at the school in California were comparable to the smoking-lung cancer risk. Of no surprise, breast cancer cases were reported in this cluster along with several other cancers including colon cancers, uterine cancers and malignant melanomas. Artificially created EM radiation (EMR) is a determinant in the development of malignant melanoma, an increasingly prevalent cancer that was uncommon until around 50 years ago.[26]

In fact, research on EMFs has been conducted for over 50 years in Russia,[27] and the newer research on dirty electricity has been carried out by Russian experts in conjunction with scientists and electrical engineers from the United States, Canada, Kazakhstan and the Ukraine.[28] Kazakhstan has already swiftly mandated protection against dirty electricity in industrial situations,[29] a model which should be implemented in all countries across the globe.

Ongoing Risk Assessment

We are in the midst of an invisible and silent plague of pandemic proportions that has been woven into our everyday lives. Dirty electricity, is in virtually every building, whether it be our homes, schools, workplaces or hospitals. Energy-efficient appliances and equipment are amongst the culprits that create dirty electricity. Dr Magda Havas, Associate Professor of Environmental and Resource Studies at Trent University, Ganada, reports that many houses with solar panels have very high levels of dirty electricity.[30] Wind turbines can also generate dirty electricity, which is then transferred along the grid.

If these EMFs released a visible substance on us, we would comprehend very quickly the attack on our body and that dirty electricity :is creating havoc with our immune systems. Even though we cannot see it and most of u .cannot feel it, dirty electricity is affecting all of us. Removing dirty electricity has seen

cases of multiple sclerosis improve dramatically and even go into remission, and has also resulted in asthmatics using inhalers less often.[31] Some diabetics are discovering that their insulin levels are being artificially raised in dirty electrical environments. In 2004, Dave Stetzer, president of Stetzer Electric, and Dr Havas presented to the WHO their research showing the difference between the blood sugar level in a dirty electrical environment (a measurement of 36) and one that was filtered (a measurement of nine).[32]

Autism is now seen as the fastest-growing developmental disability. Dr Havas reported that a recent pilot research study has shown higher rates of babies born with- autism where the mothers' sleeping locations had high levels of radio-frequency EMR.[33]

Children who have leukaemia or are in recovery have poorer survival rates if exposure to extremely low frequency EMF levels is high.[34] It follows that all ill and recovering patients should be aware of their exposure to these fields.

Lichtenstein el al. concluded from their study of identical twins that environmental factors are the initiating event in the majority of cancers.[35] On studying cancer trends in the 20th century, Hallberg and Johansson reported that there is a common environmental stress that accelerates several forms of cancer—colon cancer, lung cancer, breast cancer, bladder cancer and melanoma.[36] From when electricity was first generated to the introduction of AM radio (1920s), radar (1940s), FM radio and TV (1950s), computers (1970s), mobile phones (1980s), and wireless technologies and compact fluorescent lighting (2000s), artificially created EMR is the most likely environmental stress.

Artificially created EMR may also be the underlying menace in the tobacco smoking and asbestos crises. Hallberg and Johansson reported that exposure to radiowaves (artificially created EMR) appears to be *as big a factor in causing lung cancer as cigarette smoking*, and that deaths due to asbestosis were not known until after the 1960s despite the fact that asbestos had been used as a building material since the end of the 19th century.[37]

We cannot afford to be unsuspecting recipients of this artificial electromagnetic radiation which has been newly introduced in such a short period of our history. Associate Professor Olle Johansson, of the Department of Neuroscience at the Karolinska Institute in Sweden, commented that today no one would consider having a radioactive wristwatch with glowing digits (as you could in the 1950s), having your children's shoes fitted in a strong X-ray machine (as you could in the 1940s), keeping radium in open trays on your desk (as scientists did in the 1930s) or X-raying each other at garden parties (as physicians did in the 1920s).[38]

These examples relate to *ionising* radiation; apart from nuclear fallout, we have a choice whether to expose ourselves to it or not.

Many different types of artificially created radiation have been woven into our daily lives. It is awareness that will bring understanding of the different types of radiation so we can make our own informed choices on what we are willing to be exposed to and what we must avoid. School teachers and principals alike must be educated on this most important health issue so that measures can be put into place to ensure that they and our children are not at risk in a dirty electrical environment, for dirty electricity has been found to be especially prevalent in environments with concentrated fluorescent lights and computers. Employers and employees alike must understand that their workplace must also be

protected. People in their own homes must also protect themselves from modern equipment that also generates dirty electricity.

Finally, Dr Cedric Garland, the epidemiologist currently investigating the breast cancer cluster on the campus of the University of California, San Diego, is focusing on the possible role of EMFs, especially transients.[39] Dr Garland advised that the female employees should be informed about tamoxifen research—that ELF EMFs have been found to partially block this drug's action in preventing breast cancer spreading or a recurrence of breast cancer—and recommended that those taking the drug should be transferred to a lower-current area if they so desired.

Transients cause cancer. Just as we filter our water to remove contaminants so we have cleaner water, now we must filter our electricity to remove this contaminant so we have cleaner electricity.

http://www.whale.to/a/fisher_donna.html

Wireless Wake-Up Call: A New Paradigm in EMF Science

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I began to question the trajectory of our culture five years ago when a bank of wireless smart meters was installed below my bedroom in San Francisco. Within a week, my wife and I were experiencing headaches, insomnia, tinnitus, heart palpitations, and fatigue. We had never experienced these symptoms before and when we left our house, they diminished. After some research, I found the same thing was happening to thousands of people throughout California and other states and countries where wireless smart meters were installed.1 This set me on a journey to learn as much as possible about how electromagnetic fields (EMF) affect biology. I now have a website on this subject and recently gave a TED talk at TEDxBerkeley on the University of California, Berkeley, campus. This is called Wireless Wake-Up Call and can easily be found through an internet search. I encourage you to watch the TED talk before reading further as the talk is a good introduction to this subject. In this article, I provide more technical analysis than a fifteen-minute talk for a general audience can allow. I will cover the basic problem with the recent exponential rise in EMF pollution, the evolution of EMF science, and possible solutions. I also describe steps you can take today to create a much healthier home from this perspective.

Before we move on, I want to acknowledge that I realize this subject may be controversial for you. It was for me five years ago. The predominant view in our society is that electromagnetic fields are completely safe if they do not heat or shock you. Much of our economy is based upon this assumption, so one would conclude that it must be true. My intention is not to be confrontational. It is to begin a discussion and to encourage some of the brightest minds in the United States to realize that we are not seeing the whole picture on the safety of wireless technology. As you will see in this article and in your own research, there is now enough evidence that weak electromagnetic fields affect biology. This could have serious consequences for the future of our civilization; it is an issue we must begin to acknowledge so solutions can be created. I welcome your feedback and to furthering this discussion.

Our electromagnetic environment has changed immensely over the past ten years, and wireless technology is set to expand even faster in the next five. Before the invention of the iPhone eight years ago, the electromagnetic exposure for most people was quite low unless they were early adopters of wireless technology or lived next to a cell phone tower. However, today we have nearly ubiquitous Wi-Fi, even in schools, and additional cell towers to provide the data to everyone's smart phone. We also have smart watches, smart utility meters, smart thermostats, smart homes, and new vehicles with Bluetooth and Wi-Fi. This increase in microwave radiation is unprecedented, but it is only the beginning.

The next phase is the "Internet of Things," which will connect everything we purchase to the internet with its own IP address and wireless transmitter. The "connected home" of the future may have up to one million bursts of microwave radiation pulsing through it each day. To make all of this work and to circumvent the community review process for cell tower siting, wireless companies are now joining with local governments to put powerful cell antennas on utility poles, often just 10 to 20 feet from homes. This is called the Distributed Antenna System (DAS) and is currently being rolled out in cities such as San Francisco, where new antennas are being placed on most city blocks.2 Many cities in the United States will have this system in coming years. To add to this, Google and Facebook are competing to provide their own internet service. Through projects such as Google's "Project Loon," which will put up balloons with Wi-Fi antennas at 60,000 feet3 and Facebook's proposed 60 GHz Terragraph Wi-Fi system,4 we

have entered a new era of electromagnetic exposures. However, this is all being done on the assumption from a previous era that pulsed microwave radiation is completely safe.

Our society's EMF safety guidelines are based on thermal standards. The idea is that if non-ionizing electromagnetic fields do not heat you, then they cannot possibly hurt you. Even though there is plenty of evidence that non-thermal EMF exposures cause biological damage, this evidence is repeatedly dismissed by the private bodies and government agencies that set safety standards. The reason for this is quite practical. In the 1950s, after the development of radar in WWII, the military and industrial applications of microwave technology were seen as a higher priority than any potential ill effects on health. They reasoned the Cold War and economic growth were more important than the possibility of illness or cancer for a segment of the population 20 to 30 years in the future. However, the people making those decisions in the 1950s and 1960s could have never imagined that 60 years later, our society would be experiencing the tremendous boom in consumer wireless technology that has occurred. Nor could they have imagined the predicament that future political and industrial leaders would find themselves in. Today we have a situation where the growth in consumer wireless technology has created some of the biggest and most profitable companies in the world. This technology has quickly become an integral part of our economy and, lately, one of the few reliable growth sectors. Wireless is also an incredibly popular technology that much of the population loves and is addicted to.5 This is primarily because of the convenience and the fact that people simply enjoy communicating. Plus, it provides immense tax revenue and surveillance capabilities to the government through data collection. For all of these reasons, there is no politician or industry leader who will be able to admit the safety standards do not protect the public because they are not designed for the exposures we experience today.

The study of the biological effects of electromagnetic fields is a very complicated arena. It takes researchers who understand complex biological processes as well as the physics and engineering of electromagnetic fields. When studies find biological effects, they must then be replicated, but if just one parameter is changed slightly, the biological effect can be lost. Parameters include frequency, pulsation patterns,6 power, polarization7 , and whether windows exist where effects can be more significant at lower power levels. Additionally, the funding to repeat studies is often not available, especially when almost all funding for this type of research comes from industry sources that may not want results that could hurt their profits.8 One of the first persons to discover the biological effects of non-thermal microwave radiation was Dr. Allan Frey. In 1975, he found that microwave radiation opened the blood brain barrier of rats, which is very similar to that of humans.9 This experimental result has been repeated in subsequent studies10, 11 and is of great concern because the blood brain barrier plays a vitally important role in the protection of the brain from pathogens, toxins, and heavy metals. Many other biological effects of non-thermal EMFs have been found over time.12 They include sperm damage, nervous system disruption, cardiac/ECG changes, endocrine system malfunction, increased brain glucose levels, behavioral changes, and acute symptoms such as headaches, insomnia, tinnitus, difficulty concentrating, and fatigue. In all, over 100 non-thermal biological effects have been documented in thousands of studies on this subject.13 As might be expected, there are also many thousands of studies that show no biological effects from electromagnetic fields.14 One of the most disconcerting effects of non-thermal microwave radiation is DNA damage. The reason is obvious: DNA damage can lead to cancer and this critical outcome would require authorities to take action. The European Union funded REFLEX-Study looked at this exact issue. The 2004 study was coordinated by Dr. Franz Adlkofer in Vienna

and the published results were very concerning for the cell phone industry and the public.15 The data showed that cell phone radiation caused DNA damage.16 This was obviously quite a surprise as it had been previously thought that non-ionizing radiation could not cause DNA damage because it was not strong enough to knock an electron off a molecule. Not surprisingly, the study was quickly attacked and a leading industry-friendly scientist, Dr. Alexander Lerchl, stated that the data must have been faked. The resulting media storm and pressure on the researchers and their universities diminished the impact of Dr. Adlkofer's study and prevented the use of European Union funds to further the research. However, after a full review and investigation, the research results stand and in 2015 the Hamburg District Court in Germany forced Dr. Lerchl to recant his allegations and convicted him of defamation and libel.17

Lerchl made the news earlier in 2015 for another reason. He was the head of a study that was a replica of a 2010 research project18 that found weak 3G cell phone signals promoted tumor growth in mice.19 The positive results of his study were another blow to the cell phone industry. They confirmed that when mice are exposed to a known cancer agent, ENU, in the womb, and then also exposed to 3G cell phone radiation, there was a significant increase in tumor production over the mice that had been exposed only to ENU.20 In a press release from Jacobs University in Bremen, Germany, Dr. Lerchl stated: "Our results show that electromagnetic fields obviously enhance the growth of tumors."21 This is a significant change for a leading scientist who has spent the past couple of decades publicly stating there is no good science showing non-thermal biological effects from electromagnetic fields. However, if research increasingly shows DNA damage and cancer promotion from non-ionizing microwave radiation, what is the biological mechanism? For, without a mechanism, it will be difficult for scientists to fully accept this new paradigm.

In 2013, Dr. Martin Pall, professor emeritus from Washington State University, made a key discovery that helps us to understand this paradigm.22 Through a review of the scientific literature and his own meta-study, he found that one of the primary non-thermal effects of electromagnetic fields is the activation of voltage-gated calcium channels (VGCCs) in the plasma membrane of cells. When electromagnetic fields activate these channels, large amounts of intracellular calcium (Ca2+) are produced. This excess calcium in the cells produces a chain of chemical reactions leading to the production of free radicals and oxidative stress. The free radicals then culminate in DNA damage.23 The diagram, above, shows the basic outline of this mechanism. In short, the excess calcium directly increases nitric oxide (NO) within cells. The increase of nitric oxide can result in therapeutic effects, which is one reason why non-thermal electromagnetic fields are increasingly used in medical therapies. However, nitric oxide can also interact with superoxide (OO-) to create peroxynitrite (ONOO-). It has been found that when peroxynitrite breaks down, it creates reactive free radicals and oxidative stress within cells.24 It is these free radicals and oxidative stress from peroxynitrite that are thought to be the main culprits in causing disease and DNA damage. I encourage you to read Dr. Pall's research papers showing how this knowledge could be used to create technologies that reduce the activation of VGCCs25 and also to watch his presentation at the University of Oslo in Norway.26 In addition, the IEEE Power Electronics Magazine recently published an article on a similar mechanism for biological effects from weak electromagnetic fields.27

We are now at the point where it is no longer tenable for regulatory bodies to claim that non-thermal electromagnetic fields are safe. This is happening simultaneously with the expansion of wireless technology at an unprecedented rate. Unless something is done, within five years much of our

civilization will be filled with levels of microwave radiation that are known to cause disease. In the United States, the one regulatory body that could change the course we are on is the Federal Communications Commission (FCC). This body sets the legal exposure limits. However, its primary objective is actually to increase and monitor the advancement of wireless technology. The health of the public is not its primary concern, nor even its job. This is likely why the FCC only protects the public from thermal exposures. To further complicate this matter, the FCC is believed to be heavily influenced by the wireless industry. In 2015, the Harvard School of Ethics and journalist Norm Alster published a report on this called "Captured Agency."28 Mr. Alster details how the revolving door between the agency and the industry it supposedly regulates is endangering the public. You have to look no further than the head of the FCC, Thomas Wheeler, who was once the top wireless lobbyist in the country. Former FCC commissioners also lead prominent wireless lobbying organizations. It should be noted that Norm Alster wrote about the Dot Com crash and the 2008 Financial Crisis before they occurred. That he would now turn his considerable journalistic abilities toward this issue is very telling. One of the most striking aspects about the FCC is that the agency does not have the expertise to determine the safety of electromagnetic fields. It is legally tasked with one of the most important public safety issues, but essentially takes no responsibility. Instead, it counts on private and semi-private scientific organizations to inform it. These include IEEE, The American National Standards Institute (ANSI), the National Council on Radiation Protection and Measurements (NCRP), and a German chartered NGO called the International Commission on Non-Ionizing Radiation Protection (ICNIRP).29

One of the primary organizations that western governments, including the United States, use to set microwave radiation safety guidelines is ICNIRP.30 However, there is a problem with using private bodies for something as important as public safety. Small, private clubs can be easily manipulated by lobbying and by pressure from industry and military interests. Private organizations can also self-select members who have a certain bias toward EMF science without comment or input from the public. This is a highly undemocratic way to choose the people who are responsible for determining if the technology our children and grandchildren use on a daily basis is actually safe. Prof. Dariusz Leszczynski of Finland is an accomplished RF scientist who has written about the dangers of this situation. He was on the thirty-one member WHO International Agency for Research on Cancer committee that in 2011 determined non-thermal microwave radiation is possibly carcinogenic (Class 2b Carcinogen).31 In a recent article, he noted that the current ICNIRP members and new members coming in for the 2016-20 term are known to have identical opinions on EMF safety:32 •RF-EMF does not cause any health effects. •Human sensitivity to RF-EMF does not exist. •The only biological mechanism for RF-EMF is thermal. •Non-thermal biological effects do not exist. If our safety standards are set by an unaccountable private body made up of members who already have a bias against the considerable science showing detrimental non-thermal EMF biological effects, then it is likely we are setting up for a major health crisis.

What I have shared thus far could be considered the bad news. The good news is that solutions do exist. On a personal level, there are many things you can do to make your home, office, and children's schools safe from an electromagnetic perspective. In the two sidebars accompanying this article, the basic steps you can follow are clearly laid out. By taking these steps, you can begin to minimize exposure levels for you and your family until political will arises to create solutions on a broad scale. Solutions also exist on a societal level and this is where engineers can be of immense value. One of the primary solutions is to wire our society with optical fiber. Using light to transmit data creates no electromagnetic fields, except at the switches. Fiber optics is also "future proof" because it provides nearly unlimited bandwidth. This

will allow technology industries to prosper as bandwidth is no longer a limiting factor. Finding inexpensive ways to bring fiber optics to and within every home will be a boon. Companies are already doing this 33,34,35 and one in Germany and Austria has developed a technology that turns existing copper wiring into fiber optics by extracting the copper and blowing in optical fiber. For now, one of the most important things we can do is to limit the rollout of wireless technology to only necessary applications and in ways that do not directly overexpose humans, especially children. Our carefree expansion of wireless technology must come to an end. A more intelligent way forward is needed if we are to have a technological society that is also safe for humans. I believe that acknowledging the importance of this issue will move our society forward. It will also birth entire industries devoted to creating safer technology. Billion dollar companies can be created in this new frontier. You may already have an idea that will serve the parents who are now demanding safer technology for their children. As engineers, creating a healthy society with incredible technology would be a true paradigm shift and one of our greatest achievements. I hope you will join me in this grand endeavor.

https://www.tbp.org/pubs/Features/Su16Johnson.pdf

EMF Superhero

EMF (Electromagnetic Field) pollution can be very scary. It is somewhat invisible, a bit daunting and may seem more complicated than college calculus.

No wonder most people prefer to keep their heads in the sand. Do not fear though.

As you master each step, you will reduce one of the most potent sources of pollution on the planet. Few people realize it yet, but man-made EMF pollution may be one of the health and environmental crises of the 21st century. It is and will continue to affect nearly every family and community on the planet. The effects are just now starting to appear.

Let's get started….

EMF Superhero Training – Phase 1 (Easy and Effective – Basic Training for EMF Superheroes)

1. **Get Wired: EMF Superhero Rule #1 – Cables are Cool and Wireless is Kryptonite!** We all love the convenience of wireless and Apple likes to make us think cables are out of style. However, here is the deal – an overwhelming majority of the independent science points to the dangers of wireless technology. So, replace cordless phones and wireless baby monitors with wired versions. "DECT" cordless phones and headsets are one of the biggest sources of microwave radiation in a home or office. The same is true for your Wi-Fi router. Turn off your Wi-Fi and run an Ethernet cable from your router to your computer (more on toxic Wi-Fi in Phase 2 of your training). We can have, and will continue to have amazing technological advances – but they will be wired.
2. **Get Smart:** If you have a wireless "smart" meter attached to your home, replace it with a wiser, safer analog meter. Thousands of people in the United States, Canada and Australia have been injured by wireless "smart" meters. Further, "smart" meters are not "green" or environmentally sustainable – no matter how many times the advertising people say it. They constantly emit microwave radiation, which harms all life. How can this be sustainable? They also put "dirty electricity" onto the wiring of our homes (see Phase 2 for more on this).
3. **Get Real:** Cell phones are Kryptonite too! Now, most people love these amazing little devices. They seemingly give us incredible superpowers. However, allow me to let you in on a little secret that every EMF Superhero knows….. cell phones are the cigarettes and asbestos of our time. The Supreme Court knows this. This former wireless industry engineer even knows it. After 10 years of use, the incidence of brain cancer skyrockets – especially if you start using a cell phone as a child or teenager. So, if you must have one, use it rarely and wisely. Here are some important tips:

    - Use speakerphone or an "airtube" headset. Please don't put a cell phone to your head.
    - Primarily use a cell phone for texting and emergency calls. Save voice calls for your wired land line phone or Skype at home.
    - Keep your phone on "airplane mode" most of the time. That way it is not radiating your private parts when in your pocket. EMF Superheroes realize that "smart" phones radiate every few seconds and lessen the chance of our being able to produce little Superheroes.

- Never put an operating cell phone next to your head or reproductive organs. If you would like to train your friends and family to use a cell phone wisely, download this brilliant app to their phones (it even has a parental lock).
- Save high-data activities (videos, music, internet browsing and email) for a wired computer at home. This will greatly reduce the radiation you are exposed to. This also means the little girl living next to the cell phone tower down the road may receive a little less radiation (All EMF Superheroes care about people living next to the cell phone towers. EMF Superheroes also know that cancer clusters are appearing around the world next to cell phone towers).
- Never use a cell phone in your car. The radiation is magnified as the phone searches for the next mast and is reflected by the metal that makes up the vehicle.
- EMF Superheroes know that sacred geometry stickers and pendants, while supposedly providing superpowers, do not protect our brain cells. Don't develop a false sense of security because of them. Distance and shielding are the only known ways to reduce EMF pollution.

EMF Superhero Training – Phase 2 (Bootcamp for EMF Superheroes continues….)

1. Practice Safe PC: Computers are heavy emitters of EMF pollution. No wonder people around the world are starting to get headaches and other health effects when using them. In order to stay healthy when using a computer, EMF Superheroes always do the following:

    - Use an external keyboard and mouse (wired, not wireless). This way your hands and body are farther from the EMF pollution coming from the computer. Here is a guide that I created for this.
    - Place a Defender Pad laptop shield over the main body of the laptop in order to block some of the EMF pollution.
    - Use an older laptop – they emit less EMF pollution than newer models. PC's emit less EMF pollution than Apple computers.
    - Primarily use a laptop on battery power (not plugged-in and charging). This will decrease the EMF pollution that your body receives. You may also want to ground your computer (contact us for more info on this).
    - Use a shield in order to reduce the EMF pollution coming from the computer screen.
    - Never use a tablet (iPad) computer to surf the internet. Tablets only use Wi-Fi (EMF Superheroes know that Wi-Fi is toxic as it messes with our superhero abilities. After all, Wi-Fi is air pollution). Tablet computers constantly emit high amounts of microwave radiation (which damages our cells in ways that won't be seen for years or decades). If anyone you know has a tablet computer, make sure the "airport" or Wi-Fi functions are turned off. If your child's school wants every student to use a tablet computer – be an EMF Superhero and explain to them how dumb and shortsighted this idea is!
    - Use a wired external keyboard and mouse.
    - Use your computer strategically. Most people love Facebook, but it keeps us glued to the computer. Limit your computer use. Take frequent breaks. Go for long, slow

walks. Your nervous and immune systems will thank you. Your Superhero abilities will increase.

- If you are a writer or spend a lot of time writing, do most of your typing on an AlphaSmart 3000. These electronic keyboards emit almost zero EMF pollution, so you can type all day without headaches and then transfer the file to your primary computer.
- Connect to the internet with an Ethernet cable, not dangerous Wi-Fi. When you use Wi-Fi to connect to the internet, you are subjecting your brain and body to microwave radiation.

2. **Just Say No To Wi-Fi:** EMF Superheroes know that Wi-Fi is so 2013. Wired solutions are the future. If you really want to be high-tech, go completely wired in your home by turning off your Wi-Fi. You can run Ethernet cables to your computers. There are even technologies, such as D-Lan in Europe, where every electrical outlet in your home is wired to the internet. Important note for EMF Superheroes: If someone in your household is addicted to their beloved Wi-Fi and is not quite ready to quit cold turkey, then at least turn it off at night and when not in use. A timer is good for this (like the one used for Christmas lights). You can also put a microwave radiation reducing silver scarf over the router.
3. **Sleep Sound:** Superheroes need their beauty rest and they know that EMF Pollution affects melatonin production at night. One of best ways to sleep deeper is to have your bedroom completely free of EMF pollution. In addition to turning off all wireless devices in your home, remove and unplug all electrical devices from your bedroom. A battery-powered alarm clock is all you need (preferably not an iPhone, but if you must, be sure to keep it on "airplane" mode all night). One of the best things you can do is turn off the circuit breaker to your sleeping area. This will cut off the flow of (dirty) electricity through your bedroom walls at night. Try it – you might have the best sleep in years!
4. **Clean House:** Electricity today is now extremely "dirty". Thanks to the "smart" grid, wireless "smart" meters and all the digital devices we plug into our electrical wiring, basic electricity now produces radio-frequency radiation throughout our homes. It radiates from every wire within the walls of your home, which can cause headaches, insomnia and a myriad of health problems. EMF Superheroes know this is a huge issue and some use filters as a temporary solution. Some of the best "dirty" electricity filters can be found here. These filters are also excellent. Note that filters do not always help some electro-sensitive individuals, so test them for yourself before buying dozens. Ultimately, we will have to force the utility companies to clean up their act!
5. **See the Invisible:** You may want to hire an EMF professional to come over and measure things (highly recommended – contact us for a list of qualified professionals). However, EMF Superheroes also take matters into their own hands. Seeing and hearing is truly believing, so you must get a measurement device.

EMF Superhero Training – Phase 3 (This is where you truly become an EMF Superhero. If you have children, an electro-sensitive person in your life or care about your community and the planet, then these are the steps for you).

1. **Find the EMF Villains Near You:** No, we are not talking about your local Public Utility Commission (although they are high on the list thanks to their love of "smart" meters). We are

talking about cell phone towers! They are the toxic smokestacks of our time – spewing microwave radiation 24/7. This website shows the cell towers near you and is usually quite accurate. However, it cannot keep up with the myriad of new transmitters being installed every day by cell phone and utility companies (thanks to the infrastructure needed for millions of wireless "smart" meters). Unfortunately, any telephone pole on your street could host a wireless transmitter, which could be right outside your bedroom window. Walk around your neighborhood with your measurement device to get a truly accurate picture.

2. **Bed Canopies for EMF Superheroes:** Every EMF Superhero needs a protection at night. If you live near a wireless transmitter or cell phone tower, we highly recommend that you sleep under a bed canopy that acts as a protection shield and blocks out most of the microwave radiation (this is especially important for children and electro-sensitive individuals). Here are the best bed canopies available. Unfortunately, some people have no choice but to move away from cell phone towers because the wireless industry lobbyists snuck a rider into the 1996 Telecommunications Act that made it illegal to sue a wireless company because they destroyed your health. EMF Superheroes know this law is unconstitutional and must be overturned! Watch this video to learn more:
3. **Shields and EMF Superhero Capes:** If you are unable to fly away like other Superheroes or simply do not want to move, you can shield your home with EMF blocking paint, window shielding and other fabrics . It is vital for your long-term health that your sleeping rooms have low EMF pollution. Dr. Dietrich Klinghardt found that women who sleep in a high EMF environment either are not able to conceive or have a high risk of having an autistic child. The combination of bed canopies, shielding materials and turning off the electricity to your bedroom at night will greatly reduce the EMF pollution you are subjected to while you sleep (this is the critical time each day when your body heals itself).
4. **Strike Back:** If you got this far, you are a true EMF Superhero! It is time for you to take your new superpowers and go help the world. Find a way to raise awareness about EMF pollution. Share this page on Facebook and Twitter. Organize parents to demand that your children not be subjected to Wi-Fi all day, every day, at school. Get all your neighbors to turn off their Wi-Fi at night and opt-out of the "smart" meter program. Organize a protest around a local cell phone tower. Go make some news! Show your new EMF measurement device to family and friends. Some will even pay you to measure their home. Once people see EMF pollution with their own eyes, they will be your supporter. You will be their EMF Superhero!

You can be an EMF Superhero too. The world needs you!

https://www.emfanalysis.com/emf-superhero/

Case Study: Actual Measurements, Interpretation, and Comparison of RF Radiation Exposures

Radiofrequency Levels: *Units in* mW/m^2

No Concern: less than 0.0001	Slight Concern: 0.0001 – 0.0100	Severe Concern: 0.0100 – 1.0000	Extreme Concern: Over 1.0000

Biological effects have been observed down to very low exposure levels!

**1 mW/m² = 0.1 μW/cm²*

Power Density (mW/m^2)*	Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (All At Exposure Levels the FCC tells us are "safe")
0.000000000001	Super-low intensity RFR effects at MW resonant frequencies resulted in changes in genes; problems with chromatin conformation (DNA)
0.00000000005	Changed growth rates in yeast cells
0.0034	Chronic exposure to mobile phone pulsed RF significantly reduced sperm count
0.005	RFR decreased cell proliferation at 960 MHz GSM 217 Hz for 30-min exposure
0.006 - 0.128	Fatigue, depressive tendency, sleeping disorders, concentration difficulties, and cardiovascular problems reported with exposure to GSM 900/1800 MHz cell phone signal at base station level exposures.
0.03 - 0.2	In children and adolescents (8-17 yrs.) short-term exposure caused headache, irritation, concentration difficulties in school.
0.03 to 0.5	In children and adolescents (8-17 yrs.) short-term exposure caused conduct problems in school (behavioral problems)
0.05	In adults (30-60 yrs.) chronic exposure caused sleep disturbances, (but not significantly increased across the entire population)
0.05 - 0.4	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)
0.06 - 0.1	Chronic exposure to base station RF (whole-body) in humans showed increased stress hormones; dopamine levels substantially decreased; higher levels of adrenaline and nor-adrenaline; dose response seen; produced chronic physiological stress in cells even after 1.5 years.
0.1 - 1.1	RFR from cell towers caused fatigue, headaches, sleeping problems
0.1 - 0.5	Adults (18-91 yrs.) with short-term exposure to GSM cell phone radiation reported headache, neurological problems, and sleep and concentration problems.
0.05 - 0.4	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)
0.15 – 2.1	Adults exposed to short-term GSM 900 radiation reported changes in mental state (e.g., calmness) but limitations of study on language descriptors prevented refined word choices (stupefied, zoned-out)
0.5 - 1	RFR linked to adverse neurological, cardio symptoms and cancer risk
0.5 - 1	RFR related to headache, concentration and sleeping problems, fatigue
0.7 - 1	Sperm head abnormalities in mice exposed for 6-months to base station level RF/MW. Sperm head abnormalities occurred in 39% to 46% exposed mice (only 2% in controls) abnormalities was also found to be dose dependent. The implications of the pin-head and banana-shaped sperm head. The occurrence of sperm head observed increase occurrence of sperm head abnormalities on the reproductive health of humans living in close proximity to GSM base stations

	were discussed."
1	EEG brain waves are altered when exposed to cell phone signal
1.3	RFR from 3G cell towers decreased cognition, well-being
1.6	Motor function, memory and attention of school children affected (Latvia)
3.8	RFR affected calcium metabolism in heart cells
1.68 - 10.53	Irreversible infertility in mice after 5 generations of exposure to RFR from an 'antenna park'
2 - 80	RFR caused a two-fold increase in leukemia in children
2 - 80	RFR decreased survival in children with leukemia
2.1 - 12.8	Adolescents and adults exposed only 45 min to UMTS cell phone radiation reported increases In headaches.
5	Significant degeneration of seminiferous epithelium in mice at 2.45 GHz, 30-40 min.
5 - 10	Wi-Fi level laptop exposure for 4-hr resulted in decrease in sperm viability, DNA fragmentation with sperm samples placed in petri dishes under a laptop connected via WI-FI to the network.
8 - 100	RFR caused emotional behavior changes, free-radical damage by super-weak MWs
10	RFR induced pathological leakage of the blood-brain barrier
10	RFR caused significant effect on immune function in mice
10	RFR affected function of the immune system
10	Short-term (50 min) exposure in electrosensitive patients, caused loss of well-being after GSM and especially UMTS cell phone radiation exposure
12.5	RFR exposure affected kidney development in rats (in-utero exposure)
13 - 57	RFR associated with a doubling of leukemia in adults
15	RFR reduced memory function in rats
20	RFR induced double-strand DNA damage in rat brain cells
20 - 40	Direct effect of RFR on ion channels in cells/opening of acetylcholine channels
20 - 40	Altered cell membranes; acetylcholine-induced ion channel disruption
24	Interference with medical devices at least up to 1000 MHz
25	RFR affected calcium concentrations in heart muscle cells
40	RFR caused changes in hippocampus (brain memory and learning)
40 - 100	Visual reaction time in children is slowed/lower memory function in tests
40 - 150	Memory impairment, slowed motor skills and retarded learning in children
50	RFR caused drop in NK lymphocytes (immune function decreased)
52.5	20 minutes of RFR at cell tower frequencies induced cell stress response
50 - 100	RFR caused impaired nervous system activity
60	RFR induced DNA damage in cells
87.5	RFR at 900 MHz for 2-12 hours caused DNA breaks in leukemia cells
100	Significant differences in visual reaction time and reduced memory function
100	Changes in behavior (avoidance) after 0.5 hour exposure to pulsed RFR
100 - 250	Changes in the hippocampus of the brain
100 - 1000	Increased risk in radar operators of cancer; very short latency period; dose response to exposure level of RFR reported.
125	RFR caused calcium efflux in cells - can affect many critical cell functions
135	RFR affected human lymphocytes - induced stress response in cells

200	Increase in serum cortisol (a stress hormone)
282	RFR increased free radical production in rat cells
375	Immune system effects - elevation of PFC count (antibody producing cells)
450	Pulsed RFR affected serum testosterone levels in mice
500	Cell phone RFR caused a pathological leakage of the blood-brain barrier in 1 hour
500	An 18% reduction in REM sleep (important to memory and learning functions)
600	RFR caused structural changes in cells of mouse embryos
600	Pulsed RFR affected immune function in white blood cells
600	Cortex of the brain was activated by 15 minutes of 902 MHz cell phone
650	RFR affected genes related to cancer
925	RFR caused genetic changes in human white blood cells
1000	Changes in immune function
1000	A 26% drop in insulin
1000	A 24.3% drop in testosterone after 6 hours of CW RFR exposure
1200	A pathological leakage in the blood-brain barrier with 915 MHz cell RF
5000	Intestinal epithelial cells exposed to 2.45 GHz pulsed at 16 Hz showed changes in intercellular calcium.
5000	A 24.6% drop in testosterone and 23.2% drop in insulin after 12 hrs. of pulsed RFR exposure.

Government regulations do not protect us!

Power Density (mW/m^2)	Standard/Regulation
5300 - 6000	Limit for uncontrolled public exposure to 800-900 MHz (ANSI, IEEE, FCC)
10000	PCS STANDARD for public exposure (as of September 1,1997)
50000	PCS STANDARD for occupational exposure (as of September 1, 1997)

The BioInitiative Report (2012) recommends exposure no higher than $1mW/m^2$ – 10,000 times lower than current US FCC standards ($10,000\ mW/m^2$)

Ambient background levels of RF radiation

0.03	Background RF levels in US cities and suburbs in the 1990s
0.5	Median ambient power density in cities in Sweden (30-2000 MHz)
1 - 100	Ambient power density within 100-200' of cell site in US (data from 2000)

How Much Radiation Are You Being Exposed To?

**The Cornet ED88T meter used is only capable of measuring exposure levels up to 1827 mW/m^2 – therefore, readings of 1827 indicate that the meter was maxed out and actual RF levels were likely much higher.*

Because computers connected via Ethernet cable (most desktops PCs), corded landline telephones, and incandescent light-bulbs do not emit any microwave radiation, they were not measured. Devices in Airplane Mode also generally do not emit any microwave radiation. Notice how much radiation levels decrease as distance increases.

		Max Power Density (mW/m^2)		
	Distance from Emissions:	~ .1"	~ 1'	~ 6'
GE Microwave Oven (heating one cup of water)		1827*	1827*	178.6
Apple iPad Air	Wi-Fi – streaming video	258.1	9.81	1.555
	Wi-Fi, Bluetooth – streaming video	325	10.27	1.629
	Wi-Fi, Bluetooth	270.3	5.034	1.451
	Wi-Fi	240.9	4.384	1.207
	Bluetooth	57.8	2.05	1.294
NETGEAR Nighthawk Wireless Router		874	364.7	98.1
NETGEAR AC Series SMART Wi-Fi Router		428.5	33.26	5.78
AT&T DECT Cordless Phone Base Station		1827*	63.3	26.42
AT&T DECT Cordless Phone	Standby	0.24	0.0727	0.4092
	Connecting (Dialing)	1827*	53.94	1.827
	Connected	1827*	83.5	3.564
AT&T Digital Life Wireless Security System Base Unit (3G)		191.4	21.97	2.098
CFL Light-Bulb		0.2642	0.1555	0.1127

LED Light-Bulb		0.1386	0.1153	0.0981
CISCO Wireless Access Point	E006	409.2	24.09	0.3999
	E008	240.9	23.01	0.633
	E010	123.5	6.94	0.141
	E102	178.6	6.33	0.2409
	F120	178.6	2.831	0.5271
Apple TV	Wi-Fi	19.14	0.1153	0.258
	Wi-Fi, Bluetooth	619	10.04	1.264
	Wi-Fi, Bluetooth, Air-Play	1451	2.581	1.745
iPhone 5	Wi-Fi	33.26	0.916	0.2301
	Bluetooth	27.66	20.98	0.1355
	Wi-Fi, Bluetooth	53.94	20.5	0.1051
	Wi-Fi, making call	1153	4.092	8.54
	Bluetooth, making call	1827*	6.94	0.1324
	Wi-Fi, Bluetooth, making call	1827*	6.94	0.1324
Samsung Galaxy Note 5	Wi-Fi	20.04	2.004	0.325
	Bluetooth	874	12.64	0.0895
	Wi-Fi, Bluetooth	428.5	1.386	0.1355
	Wi-Fi (playing video)	13.24	2.301	0.4486
	Wi-Fi, Bluetooth (playing video)	17.45	2.581	0.578
	Wi-Fi, making call	409.2	3.564	0.3176
	Bluetooth, making call	515.1	7.61	2.831
	Wi-Fi, Bluetooth, making call	539.4	4.285	0.619
iMac	Wi-Fi	11.27	0.4285	0.0779
	Bluetooth	2.197	0.874	0.1264
	Wi-Fi, Bluetooth	20.5	1.745	0.2642
	Wi-Fi (playing video)	16.67	0.578	0.0527
	Wi-Fi, Bluetooth (playing video)	10.76	0.727	0.1264
Apple Bluetooth Keyboard	Passive	3.483	0.2766	0.0874
	Active Use	6.63	0.23	0.0527
Apple Bluetooth Mouse	Passive	3.483	0.2642	0.0779
	Active Use	7.97	0.2831	0.1355

MacBook	Wi-Fi	79.7	5.78	2.897
	Bluetooth	0.895	0.0711	0.039
	Wi-Fi, Bluetooth	42.85	0.779	0.1235
	Wi-Fi (playing video)	3.819	0.0491	0.0258
	Wi-Fi, Bluetooth (playing video)	3.483	0.2409	0.1101
Chromebook	Wi-Fi	2.197	0.4807	0.1127
	Bluetooth	1.418	0.0694	0.0459
	Wi-Fi, Bluetooth	2.248	0.1294	0.2301
	Wi-Fi (playing video)	17.45	0.399	0.0874
	Wi-Fi, Bluetooth (playing video)	10.51	0.194	0.0428

Severe Concern *Extreme Concern (>1)*

**This guide is not a replacement for medical advice. If you think you may be electrohypersensitive, see a doctor or professional immediately. Radiation was not measured in a 100% stable environment. You should hire a professional EMF expert for more accurate recordings. Radiation was measured using a Cornet ED88T Electrosmog meter, which can be purchased at www.stopsmartmeters.org/store/*

Comparing Wireless Device Emissions to Scientific Research

Radiation Levels (mW/m^2)		Researcher	Year
10000	**FCC Exposure Guidelines, 30 min. public exposure, based solely on thermal effects**	**FCC**	**1996**
500	**2 feet from a microwave oven**		
90	**iPads and Wi-Fi enabled laptops – direct body contact**		
60	DNA damage in cells	Phillips	1998
52.5	Induced stress response	Kwee	2001
50	**2 feet from a DECT cordless phone base station, Wi-Fi router, or Wi-Fi enabled iPad**		
50	Impaired nervous system activity	Dumansky	1974
50	Drop in NK lymphocytes (immune function decreased)	Boscolo	2001
40	Slowed memory and altered immune function in children	Chiang	1969
40	Changes in hippocampus (part of brain that controls memory, learning)	Tattersall	2001
30	Irreversible infertility in mice (3 generations)	Magras	1997
22	**2 feet from a Wi-Fi enabled laptop**		
20	Double-strand DNA damage	Kesari	2008
13	Twice the rate of leukemia in adults	Dolk	1997
12.5	Affected kidney development	Pyrpasopoulou	2004
10	Headaches, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion	Simonenko	1996
10	Affected functions of immune system	Novoselova	1999
8	Emotional behavior changes (free-radicals)	Akoev	2002
6	Change in calcium ion efflux from brain tissue	Dutta	1986
5	**10 feet from a smart-meter**		
5	Decreased sperm motility and increased DNA fragmentation	Advendano	2010
3.8	Affected calcium metabolism in heart cells	Schwartz	1990
3.5	Pathological leakage in blood-brain barrier	Salford	2003
3	Affected neurological system, brain function	Vorobyov	2010
2.2	Reduced density and number of young in bird populations	Balmori	2009
2	Decreased survival in children with leukemia	Hocking	2000
2	Twice the rate of leukemia in children	Hocking	1996
1.7	Irreversible infertility in mice (5 generations)	Magras	1997
1.6	Negatively affected memory, attention, motor function of schoolchildren	Kolodynski	1996
1.5	Reduced memory function	Nittby	2007
1.3	Decreased cognition, well-being	Zwamborn	2003
1	**10 feet from a DECT cordless phone base station or Wi-Fi router**		
0.7	Sperm head abnormalities in mice	Otitoloju	2010
0.638	Decreased cognitive function	Papageorgiou	2011
0.6	Slowing of heart, change in EEG	Serkyuk	1980

0.5	400 yards from a cell tower		
0.5	Adverse neurological, cardiovascular symptoms and cancer risk	Khurana	2010
0.5	10x increased risk of cancer in women, with short latency	Wolf	2004
0.4	10 feet from a Wi-Fi enabled laptop		
0.3	Headaches, memory changes, depressive symptoms, sleeping problems	Rassoul et al.	2000
0.1	Behavioral disruption	Navakatikan	1994
0.1	Significant increase in breast cancer and brain tumors	Oberfeld	2008
0.1	Fatigue, headaches, sleeping problems	Navarro	2003
0.05	Headaches, fatigue, cardiovascular issues	Kundi	2009
0.05	In adults 30-60 yrs., chronic exposure caused sleep disturbances	Mohler	2010
0.03	In children and adolescents 8-17 yrs., behavioral problems in school	Thomas	2010
0.03	In children and adolescents 8-17 yrs., headaches, irritation, concentration difficulties in school	Heinrich	2010
0.02	Sleep disorders, abnormal blood pressure, nervousness, fatigue, joint pain, digestive disorders, fewer schoolchildren promoted	Altpeter	1995
0.006	Fatigue, depressive tendency, sleeping disorders, concentration difficulties, cardiovascular problems	Oberfeld	2004
0.005	Decreased cell proliferation	Velizarov	1999
0.003	Significantly reduced sperm count	Behari	2006
0.000001	Natural Environment – Low Radiation		

https://wirelessaction.files.wordpress.com/2016/09/wa_rf-radiation-guide1.pdf

Digital Utility Meters ("Smart" Meters)

Smart meters and cell damage from pulsed EM radiation - our health at risk?

11th April 2017

'Smart meters' looked like a great idea, writes Lynne Wycherley, giving us more control over our energy use. The downside? They emit as many as 14,000 short bursts of intense microwave radiation a day, disrupting cellular electrochemistry and causing health symptoms from migraine to tinnitus, insomnia, dizziness, anxiety, chest pain, palpitations and memory loss. Now a growing number of 'electro-sensitives' have had enough!

"Smart meters' should be abolished because they use short high-intensity pulses of microwave radiation. We know from the nanosecond studies these can be very damaging with calcium channel activation continuing long after the pulse has ceased."

As early as 2012, environmental health Professor David Carpenter, founder of Albany School of Public Health, and author of 370 peer-reviewed publications, issued a public letter on the plausible toxic risks of intensive, pulsed-microwave smart metering.

His letter Smart-meters: Correcting the Gross Misinformation was rapidly signed by 50 international health experts.

"We, the undersigned ... have co-authored hundreds of peer-reviewed studies on the health effects of electromagnetic fields (EMFs) ... Mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios ...

"More than a thousand studies done on low intensity, high frequency, non-ionizing radiation going back at least fifty years, show ... biochemical changes which ... may lead to diseases."

Noting, among other risks, the free-radical / cellular / genetic harm recorded in many recent papers on wireless exposure - and the relative potency of smart-meters' pulses - he adds: "Prolonged exposure ... may eventually lead to cellular malfunction ... With both cell towers and smart meters, the entire body is immersed by microwaves."

Though his letter needs updating (see Belpomme, for example, below) he and his signatories are correct in signaling that all of us in the Green movement - activists, politicians, energy suppliers, families - have been given a sanitized version of long-term EMF health risks, including from high-density smart metering. At worst, equivalent to Big Tobacco's "smoke it baby! there are no risks!"

The International Appeal to the United Nations

Though there is no world consensus on the degree of risk arising from pulsed-microwave pollution (RF-EMFs), it is salutary that most independent EMF scientists are voicing caution. And their numbers are rising rapidly.

In an unprecedented step, 190 precautionary scientists launched an appeal to the United Nations (2015, ongoing) to seek progressive, healthy alternatives to high-SARS phones / tablets and the piercing pulsed microwaves from smart meters, plus similar rollouts.

"Now is the time to ask serious questions about this emerging environmental health crisis", their video warns, before offering some strong medicine:

"We have created something that is harming us and it is getting out of control! ... Wireless utility meters, and cell towers, are blanketing our neighborhoods with radiation... BIOLOGICAL facts are being ignored ... International standard setting bodies are not acting to protect the public's health." [Emphasis as per the published transcript]

In its call for cleaner, safer, ways forward, the International EMF Scientist Appeal is undeniably 'Green'. Yet how many of us are fully aware of its call? Today, it carries 224 signatories from 41 nations; all have peer-reviewed research in the field, and none - to their credit - have been cowed or co-opted by the multi-billion dollar Big Telecoms industry: a colossus whose turnover has begun to rival that of fossil fuels.

Standard-setting bodies with documented conflicts of interests, meanwhile, continue to stifle reform - not least in the UK: see the shocking exposé of AGNIR, for example, by UK neuroscientist Dr. Sarah Starkey. Plus French documentary *Microwaves, Science & Lies*, and the recent letter of no confidence in the EMF wing of the World Health Organization.

People testifying to harm

Within months of PG&E's (Pacific Gas & Electric) Californian smart-meter rollout, over 2,000 health complaints were filed. Harsh headaches, dizziness, tachycardia, insomnia, tinnitus; in desperation, some householders fled their homes, while others slept in their cars.

Let's not forget that PG&E is the energy giant first exposed by Erin Brockovich for dumping hexavalent chromium.

As wave after wave of people have attested to similar problems from US and Canadian rollouts - many testifying to no prior inkling of smart-meter problems (as here /here) - court cases have arisen. Biophysics professor Andrew Marino, an authority on physiological reactions to 'weak' EMFs, gave lengthy evidence in defence of impacted residents.

Eviscerating outdated exposure standards, he concluded "coercing the complainants to endure... such exposure ... amount[s] to involuntary human experimentation." In addition health risks from "the type of electromagnetic energy emitted from smart meters ... are heightened in the very young, the very old, and in those with pre-existing diseases and disorders."

Case histories, echoing others around the world, include, for example, 84-year old Dr. Georgetta Livingstone (Michigan). When her meter was fitted, she was hit by unexpected sharp pains in her body, headaches, violent head-to-toe rashes, insomnia, intense itching, depression and anxiety. With no remission, it seems, until her meter was finally removed. (Notice Professor O Johansson: skin reactions to EMFs). Such testimonies, however contested, may offer us helpful clues.

IT professionals are among those testifying to impacts. Silicon Valley consultant Jeromy Johnson (see his TED talk) and his wife, a GP, were axed by headaches, insomnia, and palpitations.

In Smart meters, the opposite of green, hosted by Green editor Rob Sidon, Johnson notes that if we connect everything wirelessly to smart meters we risk "filling our homes, our children, and ourselves" with RF microwaves emerging as subtly bioactive. (See, e.g., harm to insects from all 'weak' sources tested: Margaritis et al 2013). "How can a technology be considered sustainable if its byproduct harms not only humans but plants, insects and animals?"

Problems have also emerged in Australia, and beyond. In her peer-reviewed paper, Dr. Federica Lamech, GP (Victoria), shares 92 in-depth patient case histories. Smart meters, it seems, were 'the last straw' in wireless exposure, tipping them into full-blown electrosensitivity - a syndrome now hallmarked, it seems, by toxic and inflammatory biomarkers, and impaired brain blood-flow (Belpomme 2015-2016: nearly 700 lab-verified cases, Paris).

Lamech herself was stricken "with palpitations, chest pain, insomnia, dizziness, inability to concentrate, memory loss and fainting spells. I [later] found out it was [when] the smart meters were remotely turned on."

Professor Dariusz Leszczynski, biochemist, notes it is normal to have a bell-curve of responses to environmental toxins, and pulsed RF, his field, is no exception. If so, how can we, as Greens, find ways to support the human rights of adults / children at the 'unlucky' end of the spectrum?

Dr. Isaac Jamieson, who advises the EU on bio-sustainability, analysed (1, 2,) how Big Energy smart-metering can infringe the Universal Declaration of Human Rights, especially birthright to health.

Eyes on stalks: the corporate hijack of smart-metering

According to multi-award-winning health documentary Take Back Your Power, Big Energy may have hidden drivers for smart-metering. Filmed in Canada and the USA, this deeply humanitarian film, best seen in full [here], reveals how Green aims can sadly become co-opted and perverted. In a race "to monetize the data", a focus on the bottom line is sweeping injured families aside.

Director Josh del Sol told me, based on his long research, "with more than 5,000 technology patents muffled by the USPTA ... new, decentralized, clean energy technologies are in fact being artificially-blocked from market proliferation." TNCs "are hijacking the good intentions of environmentalists everywhere ... with a profit potential (for them) in the trillions."

Notice, for example, this big-client marketing by Onzo (2017): "We take data from smart meters... and build a highly personalized profile for each and every utility customer. We then tag this profile with key behavioral, attitudinal and lifestyle characteristics ... We even tag appliances that we see being used in the home. .. giving [you] the ability to monetize [your] customer data by providing a direct link to appropriate third party organizations."

Hidden risks to our cells

Dr. Dietrich Klinghardt and team (New Jersey) found striking increases in toxic, inflammatory markers in patients' blood samples - and their asymptomatic spouses - after smart-meter installation. Naturally, this needs wider testing, controlling for any confounding factors, but might there be wider risks, however subtle, at a cellular level?

Professor Martin Pall, a biochemist with 8 international awards, clearly thinks so. In 2013, he won a Global Medical Discovery listing for his landmark paper on a master mechanism of harm from wireless pulsed microwaves: watch his gripping, short talk. Supported by many peer-reviewed papers, it helps to explain the damage (nitrosative / oxidative) to organs and DNA seen in many new studies on Wi-Fi and similar sources.

It's striking that Pall singles out smart metering. *"'Smart meters' should be abolished because they use short high-intensity pulses of microwave radiation. We know from the nanosecond studies these can be*

very damaging and act via VGCC [calcium channel] activation [his research] with activation continuing long after the pulse has ceased ... It has been known for over 30 years that short microwave pulses can cause massive cellular damage." See also his review of pulsed-microwave neurological risks, including from wireless smart meters (2015).

Disturbing toxic 'window effects' have been found at low wireless intensities: co-tumor promotion, for example, from levels comparable to tablets' (Professor Lerchl 2015). While peer-reviewed findings at far lower levels - a clue to life's sensitivity - raise growing questions about microwave-dense 'smart homes' and corporate IoT.

A 2011 study, 'Electromagnetic hypersensitivity: evidence for a novel neurological syndrome' described by DE McCarty et al in the *International Journal of Neurosciences* concluded that *"EMF hypersensitivity can occur as a bona fide environmentally inducible neurological syndrome."*

The single subject was a self-diagnosed EMF sensitive exposed to a 60Hz field of 300V/m in a *"double-blinded EMF provocation procedure specifically designed to minimize unintentional sensory cues"* who *"developed temporal pain, headache, muscle twitching, and skipped heartbeats within 100 s after initiation of EMF exposure ($p < .05$)."*

The authors continue: *"The symptoms were caused primarily by field transitions (off-on, on-off) rather than the presence of the field, as assessed by comparing the frequency and severity of the effects of pulsed and continuous fields in relation to sham exposure. The subject had no conscious perception of the field as judged by her inability to report its presence more often than in the sham control.*

"The subject demonstrated statistically reliable somatic reactions in response to exposure to subliminal EMFs under conditions that reasonably excluded a causative role for psychological processes."

Downplayed pollution; ripples in the UK

When governments or smart-meter manufacturers cite 'compliance', they are referring to widely challenged 'safety standards' based on high microwave levels that cook tissue; all risks from lower exposures - growing annually in peer-reviewed literature - are air-brushed away.

Output is often time-averaged, disguising the microwave pulse-intensity, allowing some misleading comparisons with cell-phones: see industry whistle-blower Diana Ostermann and Dr. Karl Maret. Sporadic uploads to masts (WAN) can be cited without mentioning the all-hour house-piercing 'spikes' [here] - every two seconds, in the case of tested British Gas meters.

Dr. Andrew Tresidder, GP, perceives medical risks (ditto Dr. Liz Evans GP): *"some have 14,000 very high intensity spikes per day. Biologically, 14,000 screams are not silence!"* Data obtained by a Californian court revealed, for example, 9,600 spikes per day, rising up to 190,000.

Dr. Andrew Goldsworthy, a senior EMF biologist, advised Parliament that permanent exposure *"without the fully informed consent of the people affected is in contravention of the Nuremberg code".* Contrast this to Big Energy's all-soothing, all-cosy smart meter adverts, and questions of ethics hit home.

As Greens, we may have missed these aspects. Governments, in Rachel Carson's words, have fed us *"little tranquilliser pills of half truth".* Can we catch up with the rapidly growing precautionary science? In all conscience, how many households may be struggling with hidden impacts?

With no clue that the meters (though not a full-blown mesh network, UK) may be a plausible risk factor, particularly if by children's bedrooms or banked in flats? *(See **Notes** for emerging case histories)*.

Kilohertz voltage-spikes from smart meter's switched-mode power (lay measurements here) can add to EMFs in homes, and raise other potential health questions (see Dr. David Carpenter), even - unfortunately - in wired smart-meters.

Under revised EU energy rules, meanwhile, some countries have waived smart-metering as cost-ineffective. Overseas, fires have prompted some large recalls.

A potential creeping stress on trees?
In last year's peer-reviewed research paper revealing phone-mast microwave damage to trees - even, in cases, at two miles - the authors noted *"this constitutes a danger to trees worldwide".* Might wireless smart grids exacerbate this? Notice Professor C Georgiou's work on EMF free-radical risks to plants, and Haggerty 2010 on aspen seedlings sickened by background RF.

Civilian researchers in Monterey (California) recorded unusual bark splits in oaks and pines following the microwave 'smart' grid and Wi-Fi grid switch-on: could this be a theme for eco-research? According (again) to Dr. Andrew Goldsworthy, Imperial College, in *Why Our Urban Trees Are Dying*, our rocketing RF pollution could be a factor in tree disease:

"Trees are now dying mysteriously from a variety of diseases in urban areas all over Europe and are also showing abnormal photoperiodic responses. In addition, many have cancer-like growths under the bark (phloem nodules) and the bark may also split so that the underlying tissues become infected. All of these can be explained as being a result of ... radio-frequency radiation."

Wings for a wiser world
As Greens, we have not always penetrated the emerging risks of dense, pulsed-microwave smart-metering and grids. Nor have we questioned, as fully as we might, other electrosmog raisers, such as LTE, IoT and corporate-proposed 5G. [NEW: see the Environmental Health Trust on 5G and the skin-burning properties of weak millimeter waves.]

Nor have we challenged the deep, pervasive big-industry influences on EMF research, regulation, and 'spin', as exposed in a remarkable new book (just published), *Corporate Ties That Bind: An Examination of Corporate Manipulation and Vested Interests in Public Health.*

But as we catch up with the latest cautioning science, we can begin to expose these dark trends, and the risks and pollution levels they feed. While laying bare the outworn paradigm (denial of all non-heating effects) to which TNCs and governments so scandalously cling.

And on balance, we could begin to initiate healing changes. For though it is challenging to discover that pulsed RF is emerging, by degrees, as subtly bioactive, our Green ethics, our courage, surely enables us to adapt.

Potential solutions, for social and technical visionaries, are legion. From the new, responsive data-over-grid technology, for example, that can manage energy without microwave smart meters. To cleaning up kilohertz EMFs (dirty electricity, also from solar inverters) including, perhaps, the subtly neuro-active frequencies.

To the deep carbon savings of simple energy bill comparison with neighbors, a growing trend. To lending families plug-in energy monitors, perhaps, an alternative to permanent pollution. To conserving wired resources while cleaner technologies evolve. To the inspiring possibilities of data-rich infrared and VLC (Li-Fi / visual light communication) - now found to have useful reflectivity - combined with fiber-optics ... And so on.

Globally, the more we can integrate EMF precautionary science into our daily lives, low carbon strategies, and environmental health awareness, then the more bio-sensitive, and inspiringly fit for the future, we become. So hatching an overdue paradigm - Wings for a wiser world.

http://www.theecologist.org/campaigning/2988831/smart_meters_and_cell_damage_from_pulsed_em_radiation_our_health_at_risk.html

Getting Smarter About the Smart Grid

Abstract

In recent years, the notion of the "smart grid" has emerged—first using information technology as a means of improving electricity reliability—then more recently to improve efficiency, reduce pollution, and to incorporate more renewable generation. But the public face of this smart grid has too often become the deployment of vast networks of remotely readable electric meters by utilities, often with large government subsidies. In the name of the smart grid, billions of taxpayer and ratepayer dollars are being spent on these so-called "smart meters." But now the utilities and their smart meters are experiencing increasing public pushback. In reality, these meters and their dedicated networks are primarily for the benefit of utilities, reducing their operating costs and increasing profits by firing meter readers—ironically with federal stimulus funds—while doing essentially nothing to advance what should be the real goal of the smart grid: balancing supply and demand and integrating more renewable sources. Instead, the meter networks squander vast sums of money, create enormous risks to privacy and security, introduce known and still unknown possible risks to public health, and sour the public on the true promise of the smart grid. This paper examines the technical shortcomings of the smart meter strategy along with its related economic, privacy, security, and potential health risks—explaining why this approach cannot lead to energy sustainability. It analyzes the failures of both federal grid policy and state regulation. It further explores and explains the technical challenges and economic potential of a true smart grid. Finally, it proposes a roadmap for a transformation to a renewable, sustainable electricity economy that could lead the way to a clean energy future.

It is obvious from decades of research on a wide range of frequencies within the radiofrequency (RF) spectrum that EMFs have biological effects, and associated health effects are likely. But the nature and extent of such effects (including cumulative effects) and any associated risk is not clear. Such effects have not been well researched for all frequencies and power densities, including those relevant to smart meters. For example, mobile phone radiation has long been a matter of concern and some scientific controversy. The World Health Organization (WHO) had conducted a study of cancer risk in cellphone users, known as the Interphone Study, begun in the late 1990s and sponsored by thirteen nations, various cellphone manufacturers, and other industry groups (Interphone, 2012).45 WHO has reportedly been assuring consumers that no adverse health effects had been established (Dellorto, 2011). However, in May of 2011, a review of the research by WHO's International Agency for Research on Cancer (IARC) found evidence that mobile phone users display significantly increased incidence of glioma and acoustic neuroma brain cancer (Dellorto, 2011). After reviewing the WHO Interphone Study and other evidence, IARC classified radiofrequency radiation as a Class 2B "possible carcinogen"—thus listing cell phone use, and other RF emitting devices and equipment, in the same "carcinogenic hazard" category as lead, engine exhaust, and chloroform.46

Other criticisms of the Interphone Study have also emerged, including that the evidence for risk may have been understated due to design flaws by as much as 25% (Morgan, 2010).

Then in October, 2011, a large government-funded study by Danish researchers found no increased risk of brain cancer associated with mobile device use, although the study was criticized because "brain tumors can take a long time to develop" (Cheng, 2011), and because of serious design flaws in this ongoing study that would serve to underestimate risk 48 (BMJ, 2012; ElectromagneticHealth.org, 2011; 2011a).

Although both involve microwave frequency radiation, it is difficult to draw a comparison between cellular telephones and smart meters. Cellphones are used intermittently and held close to the head, while (mesh network) meters operate continuously, and the radiation generated may or may not be in close proximity to residents. Moreover, propagation characteristics vary widely. An added complication with cellphone measurements is that newer cellphones employ adaptive power control techniques. This means that actual transmitted maximum power levels can vary over orders of magnitude depending on conditions. Nevertheless, many utility customers in several states have reported a variety of harmful effects including sleep disorders, headaches, nausea, neurological diseases, heart irregularities, cognitive impairment, fetal risks, etc.

Critics of this report responded that it "minimized" some risks and failed to provide modeling or actual measurements of smart meters (Maret, 2011, p. 1), and that "…rather than being an independent science-based study, the CSST [report] largely cuts and pastes estimates from a brochure by the Electric Power Research Institute (EPRI), an industry group, issued some weeks earlier" (Hirsch, 2011, p. 1). Hirsch, a nuclear policy analyst at the University of California, also challenged the report's failure to consider the relative duty cycles of smart meters, cellphones, and microwave ovens, and he contended that the cumulative whole body exposure from meters could actually, under some circumstances, be 100 times higher when appropriate corrections are made.

Other critics of the CSST Report challenge the third and fourth findings (above), i.e., that there is a lack of evidence of non-thermal health effects from RF radiation. The presently accepted measure of EMF dose is the thermally-based specific absorption rate (SAR)—the rate at which electromagnetic energy is absorbed by tissue. Columbia University cellular biologists Blank and Goodman (2012) propose that the SAR value used to set the safety standard for EMF "…fails as a standard for predicting cancer risk…because cancers are believed to arise from mutations in DNA…" They argue that such DNA changes can be induced at electromagnetic radiation levels that are orders of magnitude lower than those observed SAR thermal effects. They propose that changes in DNA induced by interaction with EMF could be a better measure of the biologically effective dose…" They also propose a specific mechanism of non-thermal energy absorption based on the properties of DNA acting as a "fractal antenna" structure with an extremely wide frequency range (Blank and Goodman, 2011).49

Another contrast between cellphones and meters is that cellphone use is optional and under control of those being exposed, whereas smart meters are not.

Olle Johansson, PhD, Associate Professor, Department of Neuroscience, Karolinska Institute in Sweden, and Professor, Royal Institute of Technology, argues that an array of health effects and disorders have been demonstrated to result from non-thermal levels of EMF and that utility meters and other emitting appliances should be hard-wired (Johansson, 2012). 50

Karl Maret, MD, a physician specializing in electrical and biomedical engineering, has similarly argued that EMF health effects are likely and should be mitigated by shifting to hard-wiring meters (Maret, 2012). 51 In recent testimony to the Senate Finance Committee in the Vermont State Legislature, Dr. Maret emphasized the need to hard-wired meters, saying, "With the wired meters our health long-term would be more assured. There would be no radiation whatsoever, and I think that's the core issue here." (Caruso, 2012)

The American Academy of Environmental Medicine (AAEM) adopted a resolution in January 2012 calling for a halt to wireless smart meters based on a review of the scientific and medical literature. The resolution stated, "Chronic exposure to wireless radiofrequency radiation is a preventable environmental hazard that is sufficiently well documented to warrant immediate preventative public health action" (AAEM, 2012, p 1). The resolution affirmed that the FCC guidelines consider only thermal exposures and so are inadequate for application to public health standards.

http://gettingsmarteraboutthesmartgrid.org/pdf/SmartGrid_Report_PDF-2012-11-26-Final.pdf

Electric Smart Meters: Not a Smart Solution for Your Health?

Electric smart meter… Going on just the name, this sounds like something really cool, right?

But just how "cool" are smart meters? Not cool at all actually. While the government and utility companies echo each other on how safe smart meters for electricity are – a growing number of some people are vehemently opposed to a smart meter being installed on their property.

Nomi Davis is one of these people. She resides in Salt Spring Island, Vancouver, Canada, and took out a class action lawsuit against the British Columbia Hydro and Power Authority to demand freedom of choice for all of BC Hydro's customers.

Jennifer Stahl and Malia "Kim" Bendis, two mothers living in Naperville were arrested for trying to stop utility workers and local police from trespassing on their private property in order to install smart meters.

Not just individual homeowners, but entire communities up and down the country and across the globe are up in arms because the electric smart meter roll-out is practically global.

So what's all the fuss about?

What is a Smart Meter?
It's quite simply a type of meter that can be used to measure your electric, gas, or water usage. That all? Not quite. Smart meters have earned the sobriquet "smart" because they send back information on your power consumption to the utility company. The utility companies argue that smart meters enable them to embrace the convenience of technology and the meter man no longer needs to come round to check your water, gas, or electricity consumption.

The truth though is that smart meters may help utility companies save money… but it is at the expense of our health. There are many reasons people are opposed to smart meters:

- they overcharge the consumer
- they broadcast your personal info and detailed energy use habits
- they are a fire risk
- they emit electromagnetic fields (EMFs)

The emission of EMFs is probably the most important issue.

Why Are Smart Meter Dangerous?
Typically, smart meters utilize a form of EMF called radio frequency (RF) radiation to send consumption data back to their main system. This RF radiation, or microwave radiation, is of a similar frequency to that used in cordless phones, cell phones, Wi-Fi routers, and other wireless devices. Even though the smart meter is installed outside your house, this RF radiation can easily penetrate walls and your body too.

Many smart meters emit radiation constantly. The utility company PG&E's own documents reveal that their meters pulse 10,000 times a day. As a result, your body is constantly exposed to this radiation. On a daily basis, your cells go through a natural process of degeneration, production as well as division.

When new cells are produced with damaged DNA molecules and continue to be replicated, health issues such as cancer and long-term gene mutation can occur.

Other health issues that have been conncected with smart meters are:

- learning and memory problems
- difficulty sleeping
- fatigue
- tinnitus
- headaches
- anxiety and depression
- arthritis
- skin reaction
- hyperactivity in children
- neuropathy
- and many more

Electric Smart Meters Create Dirty Electricity

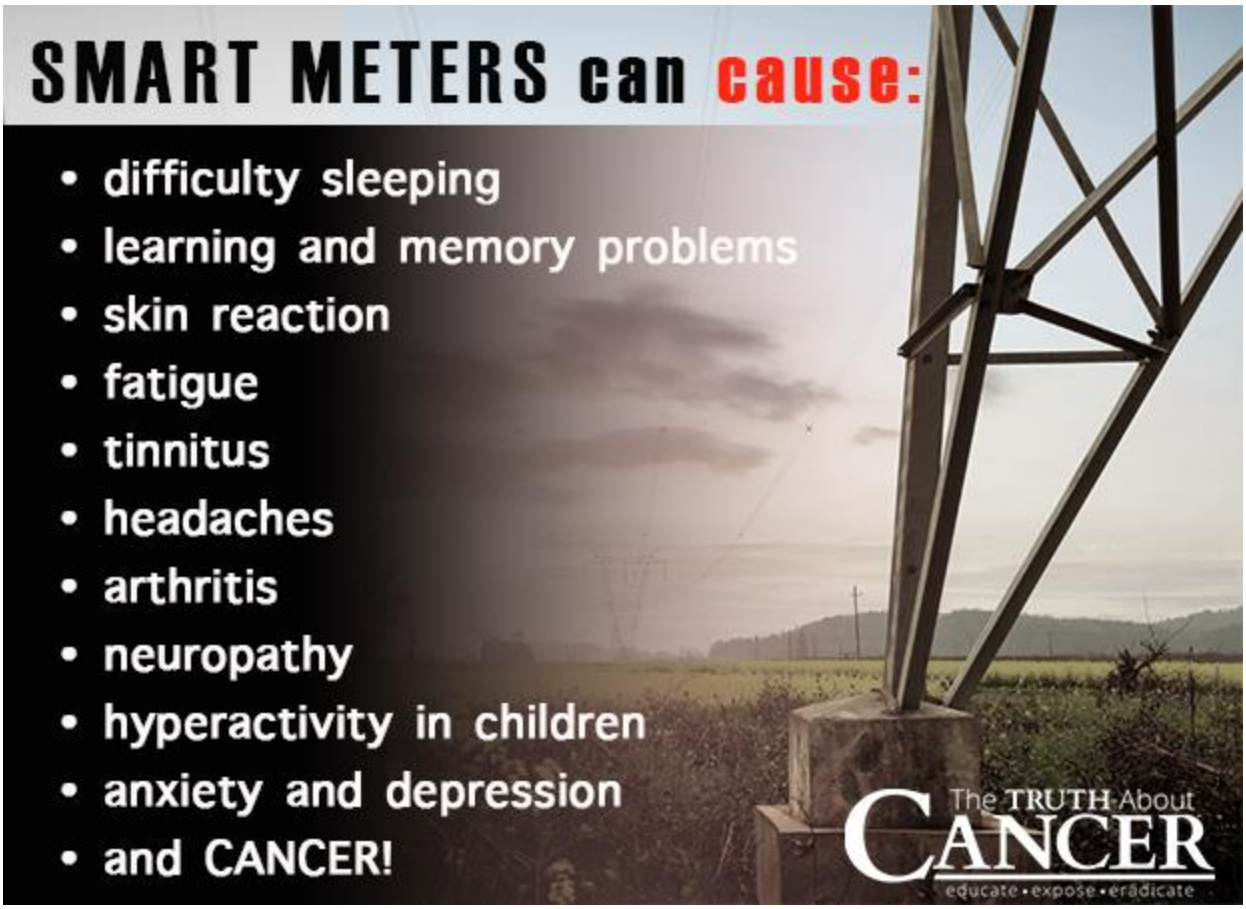
Not all smart meters utilize wireless means to send information back to the utility company. Some use powerline networking. This means that data is sent back on the same wiring line, instead of wirelessly. This creates dirty electricity, a form of electromagnetic pollution which is linked to a long list of diseases.

Even if your smart meter does not use powerline networking it's still very likely that you are being subjected to dirty electricity. This is because most smart meters use switched mode power supply technology in them, which creates dirty electricity.

Smart meters Cause 160 Times More Radiation Exposure Than Cell Phones

Daniel Hirsch, a lecturer and expert in nuclear policy at University of California, Santa Cruz, has studied smart meters. He found that given that smart meters operate 24/7, they emit 160 times more cumulative whole-body exposure than a cell phone.

He states that: *"the cumulative whole body exposure from a Smart Meter at 3 feet appears to be approximately two orders of magnitude higher than that of a cell phone."*



Precautionary Actions to Take

- Call up your utility company to check if your meter has been changed to a smart meter. If that ends up fruitless, physically inspect your meter. If it has a digital display, it is most likely a smart meter. If there are dials, then you probably still have an analog meter.
- If in doubt take readings with a radio frequency (RF) meter. Or call in a building biologist or other qualified EMF consultant to take readings.
- If you discover you have a smart meter, contact your utility to opt-out. And contact a local electrician to install an analog meter. You can buy an analog meter on the Internet for under $40. But you may have to pay a monthly opt-out fee.
- The other option is to shield. If you can't have your smart meter removed then several smart meter shielding options exist − some are more effective than others. My advice is to always test before and after with an RF meter to ensure that the shielding has been effective.

Make sure that any correspondence with your utility company is done via registered mail. This way you will have a paper trail to fall back on should you need to.

Making a Bigger Impact in Protecting Against EMFs

Now that you've protected yourself, you can move on to making a bigger impact on this matter. File complaints regarding the smart meter to bodies such as the Consumer Product Safety Commission, Consumer Reports, Special Litigation Section of the U.S. Department of Justice, EMR Policy Institute or

to the FDA. Insert evidence you have collected previously to make a stronger case and urge many more in your local area to lodge complaints too. The larger the number, the louder the voice!

If you would like to do more on a national scale, you can participate in movements like *Take Back Your Power* and *Stop Smart Meters* (just Google them to learn more). These offer a platform to get your voice heard alongside like-minded people who are opposed to smart meter installation. It is also for citizens to join together to have the freedom to choose whether they'd like a smart meter installed on their property or not.

Take Responsibility For Your Own Health

According to consulting engineer Rob States, the objectives of the Smart Grid Program can be achieved without using smart meters. Furthermore, many people claim higher utility bills since they've had a smart meter installed.

More importantly, the long-term effects of smart meter radiation are a cause for concern. It's up to you as an individual to take responsibility for your own health, as many people are finding out… living in proximity to a smart meter is not conducive with healthy living.

Live your life without the threat of cancer. Go here to be notified each week about new, cutting-edge information that impacts your health.

https://thetruthaboutcancer.com/electric-smart-meters/

Smart Meter Radiation 100 Times Greater Than Cell Phones—And Exposure Is Constant, Doctors Warn

Smart meters appeared on the power grid scene as a way for electric companies to take readings of customers' usage without an actual person having to visit every building.

These little devices were presented as a way to save time, money, and the gasoline required to drive around all day.

Some even to so far as to say that this technology would be more eco-friendly. However, experts have now voiced their concerns over smart meter radiation.
Using radio frequency microwave transmissions (RF) pulsing continuously through your home, meters measure energy usage and send the information to the energy provider.

Transmissions are relayed at intervals via power lines, the internet, or cellular modes—internet and cell (wireless) being the most common.

The American Cancer Society's warns:

"Smart meters give off RF radiation. RF radiation is low-energy radiation. RF radiation doesn't have enough energy to remove charged particles such as electrons (ionize), and so is called non-ionizing radiation. Non-ionizing radiation has enough energy to move atoms in a molecule around or cause them to vibrate, which can lead to heat but it can't damage DNA directly."

"RF radiation is classified by the International Agency for Research on Cancer (IARC), as 'possibly carcinogenic to humans.' This is based on the finding of a possible link in at least one study between cell phone use and a specific type of brain tumor. Because RF radiation is a possible carcinogen, and smart meters give off RF radiation, it is possible that smart meters could increase cancer risk…Smart meters have not been studied to see if they cause health problems."

The American Academy of Environmental Medicine issued a letter to the state of California to oppose the use of Smart Meters: "based on a scientific assessment of the current medical literature…Chronic exposure to wireless radiofrequency radiation is a preventable environmental hazard that is sufficiently well documented to warrant immediate preventative public health action." (2)

Dr. David Carpenter is a vocal opponent of Smart Meters. With very impressive medical credentials, he warns of the ill effects to the central nervous and reproductive systems. In addition, he highlights the documented evidence that RF causes cancer.

La Maison Saine et Écologie published an open letter from Dr. Carpenter that was endorsed by over fifty international experts. In it, he delineates the dangers that the RF microwave radiation from Smart Meters pose (3).

Links to cell phone use and brain tumors have been established by several independent studies (4). In fact, it's estimated that Smart Meters emit 160 times more radiation than cell phones do (5, 6).

A class-action tort lawsuit was filed against Southern California Edison in 2013 for health damage caused by the use of Smart Meters (7). More specifically, lawsuits have reported symptoms of insomnia, dizziness, nausea, heart palpitations, interference with pacemakers, tinnitus, seizures, and chronic headaches.

https://dailyhealthpost.com/smart-meter-radiation/

Toxic radiation: So-called 'SMART METERS' are anything but smart

An estimated 65 million American homes already have one. They have been touted as being part of the "*green energy revolution*," a way to reduce energy consumption nationwide and of benefit to the consumer overall. But, countless accounts of sickness and even death are telling an entirely different story – when it comes to so-called 'smart meters.'

In reality, smart meters are not smart, they're actually emitting toxic radiation and are quite dangerous – on so many levels. Repeated exposure can lead to migraines and neurological conditions as well as brain, breast and other kinds of cancer.

Smart metering signifies the digitalization of individual energy use into one central "grid." Smart meters are individual two-way communication systems that are part of this larger grid. Within them, energy usage over a certain period of time is calculated and that information is sent to the energy company in that region via a Wi-Fi network.

Smart meters are also part of a larger network called the Advanced Metering Infrastructure (AMI). AMI began with the American Recovery and Investment Act of 2009. According to an in-depth Westin-Price report conducted in 2015, the Obama Administration has poured an estimated 11 billion dollars into AMI – mostly for incentive programs to encourage utility companies to participate.

AMI connects all electrical service across the entire nation into one networked system. According to the Westin-Price report, the Department of Energy (DOE) and the U.S. Department of Agriculture (USDA), as well as major universities and corporations, including "General Electric, IBM, Hewlett Packard, Siemens, Toshiba, Microsoft, Cisco, Verizon, Google, Itron and Tantalus," are making huge profits off of the creation and maintenance of AMI.

And that may be just the tip of the iceberg. According to a letter written by Virginia Farver, whose son Rich was part of the "Brain Cancer Cluster" (half a dozen students who developed fatal brain cancers between 2008-2010 on the campus of San Diego State University), also part of the SMART Grid network is a world-wide network of communications systems which includes academic-based regional computer networks such as San Diego's High Performance Wireless Research and Education Network (HPWREN), Lambda Rail (Grid), the Tera Grid and the PRAGAMA Grid.

All of the college students who died during those years spent significant time in a first-floor room located directly below a HPWREN cell tower, which was also part of the UCSD Supercomputer Center in San Diego as well as a source for the Ground Wave Emergency Network (GWEN). According to Farver, GWEN's emissions in particular have been known to "hug the ground."

Farver and the Brain Cancer Cluster story were featured in the 2013 film, Take Back Your Power.

The Brain Cancer Cluster group at SDSU ultimately perished of cancers such as brain lymphoma and glioblastoma. Their symptoms began, however, with headaches, nausea, heart palpitations, sinus problems, insomnia and nose bleeds – classic symptoms of what is known as "Electro-Sensitivity." Their bodies were inundated with microwave radiation without end.

And this is exactly what happens to vulnerable residents of a household that has a smart meter installed on their home.

Residential smart meters can be programmed to gather information as often as every 15 seconds and emit pulsed non-ionizing microwaves (similar to a cell phone) to the tune of 10,000 to 200,000 pulses per meter per day. With that much EMFs, the body simply never has time to recover. Keep in mind, the World Health Organization has classified non-ionizing radiation as a Class 2B Carcinogen, on par with lead and propylene oxide – both known carcinogens.

To date there has been no "official" study as to the health effects of smart meters on humans. Medical professionals and concerned citizens are conducting their own experiments, however. In the film, *Take Back Your Power*, independent researcher Dr. Frank Springbob studied samples of patient's blood under black-field microscopy after about a minute of exposure one foot away from a smart meter. The results were shocking and included corrugated blood cells as well as red blood cell clumping to what were healthy cells before exposure. These are all signs of free-radical damage.

The situation has become so dire that the American Academy of Environmental Medicine (AAEM) has proposed that a moratorium be placed on smart meter technology until the health effects can be adequately studied.

http://www.naturalhealth365.com/toxic-radiation-brain-cancer-1994.html

EMF damages chitin – the missing link to bee deaths and monarch butterfly declines?

Steep recent declines in bee and butterfly populations have alarmed biologists and the public. Parasites have caused recent devastating impacts to bees.

Why is chitin important?

Chitin, the second most important natural polymer in the world,…

Chitin, the second most abundant natural polymer in the world, functions as a natural structural polysaccharide [A major component of the carapaces, crusts and shells of crustaceans such as shrimps, crabs and lobsters, it is also an ingredient of cell walls in fungi and yeast..

Chitin is isolated from the exoskeletons of crustaceans, molluscs, insects and certain fungi. [i]

Bees' and other insects' bodies are covered by an exoskeleton of small, movable plates of chitin. The 'veins' in insect wings are chitin. Chitin is part of the cell walls. .[ii] This is a critically important material.

…many "critters" on the low end of the food chain rely upon "chitin" a particularly amazing organic chain molecule with structural, optical properties, and even the ability to as a sensory device for various electro-magnetic energies.

But what is most interesting to me, is that chitin is a particularly effective bio-concentrator for man made radiation and heavy metals.

Chitin is particularly strong with its chemical bonds, most acids cannot destroy chitin. But radiation is also particularly good at destroying the chitin bonds, thus destroying the chitin.

So radiation is destroying the basis of the ocean food chain.

Curiously enough, bees and butterflies also use chitin in their structures and functional features. Damage to chitin exoskeleton makes it easier for parasites to get in, and that is a main cause of bee deaths…[iii]

If you damage or destroy the chitin, these insects and sea creatures are defenseless or dead. Reproduction will stop. Extinction is probable.

The article from Nuke Professional below[iv] outlines the impact to chitin from ionizing radiation. Radioactive contamination of air and ocean especially from Fukushima, as well as from nuclear plants' regular emissions, and nuclear waste worldwide, is having devastating impacts. This includes the effects to ocean creatures which have chitin.

Can the EMF from cell phones, cell towers, Wi-Fi, Smart Meters and wireless devices also damage chitin?

This research was published recently, posted by Dr. Joel Moskowitz of UC Berkeley.[v]

On a Possible Mechanism of the Effect of Microwave Radiation on Biological Macromolecules[vi]

Nikiforov VN, Ivanov AV, Ivanova EK, Tamarov KP, Oksengendler BL. [On a Possible Mechanism of the Effect of Microwave Radiation on Biological Macromolecules].Â Biofizika. 2016 Mar-Apr;61(2):255-8. [Article in Russian]

Abstract

A model describing the process of dissociation of hydrogen bonding in water clusters when irradiated by electromagnetic field in the microwave range is suggested. The model is also applicable for the case of rupture of the covalent bond of the water molecule cluster. If the energy absorption occurs at the interface of water and polymer clusters (e.g., DNA, chitosan), degradation of the polymer chain is possible.

From the beginning of Smart Meter deployments, people have witnessed odd bee behavior, bee disappearance, and bee deaths. Impacts to bees from EMF and RF were the subject of "Bees, Birds and Mankind: Destroying Nature by Electrosmog" translated to English in 2007 http://www.hese-project.org/hese-uk/en/papers/warnke_bbm.pdf

FCC proposes 5G with even higher frequencies which are closer to ionizing radiation and have more power to break chemical bonds. Space-based Wi-Fi plans such as Project Loon will completely blanket the earth in these frequencies.

Humans can't survive without bees and other pollinators.

Some experts warn that the ongoing Fukushima disaster will cause an extinction level event (ELE).

Will the Internet of Things and 5G cause a double ELE?

https://smartmeterharm.org/2016/08/08/emf-damages-chitin-the-missing-link-to-bee-deaths-and-monarch-butterfly-declines-will-the-smart-grid-5g-and-project-loon-finish-the-bees/

Biological Effects from RF Radiation at Low Intensity Exposure, based on the BioInitiative 2012 Report, and the Implications for Smart Meters and Smart Appliances

Introduction and Conclusions

The Biological Effects Chart, at the end of this document, has been produced using data from a massive new review of the medical research literature on the biological effects of electromagnetic fields. That review is called the BioInitiative 2012 Report.2 The purpose of the Biological Effects Chart is to show the radiofrequency (RF) exposure levels at which biological effects were found in 67 studies from the RF Color Charts of the BioInitiative 2012 Report, and then to compare those exposure levels to the following:

(1) Current FCC Maximum Permitted Exposure (MPE) limits that govern Smart Meters and Smart Appliances in the United States
(2) New biologically based RF exposure limits proposed in the BioInitiative 2012 Report
(3) Calculated RF exposure levels produced by a single Smart Meter at various distances
(4) Calculated RF exposure levels produced by a single Smart Appliance at various distances

This comparison is based on RF exposure levels expressed as the RF power density (RF power per unit area). This comparison does not address other potentially important factors such as carrier continuity (continuous versus pulsed radiation) and modulation technique (the method used to impress information on the carrier), among others. The purpose is to identify what biological effects arise from exposure to RF power density levels like those produced by Smart Meters and Smart Appliances.

This comparison indicates the following:

(1) The current FCC Maximum Permitted Exposure (MPE) limits are so high that they provide no protection for the public from the biological effects found in any of the 67 studies.
(2) New biologically based RF exposure limits proposed in the BioInitiative 2012 Report are 1 million times lower than current FCC limits and would protect against the biological effects found in nearly all of the 67 studies.
(3) A single Smart Meter on a home can produce RF exposure levels that caused the biological effects found in either most or many of the 67 studies, depending on the distance from the Smart Meter.
(4) A single Smart Appliance in the home can produce RF exposure levels that caused the biological effects found in nearly half or fewer of the 67 studies, depending on the distance from the Smart Appliance. Multiple Smart Appliances in a home multiply the total exposure.
(5) A single Smart Meter on a nearest neighbor's home can produce RF exposure levels that caused the biological effects found in many of the 67 studies. A given home may have one to eight nearest neighbors, each with a Smart Meter, multiplying the total exposure in the given home.

Conclusions and Observations

Current FCC Maximum Permitted Exposure (MPE) Limits Are Too High to Protect the Public

Because the FCC Maximum Permitted Exposure (MPE) limits are at power densities higher than the power densities addressed in all of the 67 studies, those limits provide no protection against the biological effects found in any of the 67 studies, no matter what the source of the RF radiation.

Further, the FCC Maximum Permitted Exposure limits apply to each source of radiation, individually, not to the combined exposure from all sources. But a person will generally be exposed to radiation from a combination of sources. So the FCC Maximum Permitted Exposure limits not only are too high to protect a person from a single source of radiation, but also do not consider the actual exposure received by a person from multiple sources of radiation.

New Biologically Based RF Exposure Limits, Proposed in the BioInitiative 2012 Report, are 1 Million Times Lower than the FCC Limits, to Protect the Public

The new RF exposure limits proposed in the BioInitiative 2012 Report are about 1 million times lower (stricter) than the current FCC Maximum Permitted Exposure Limits in the frequency ranges at which Smart Meters, Collector Smart Meters, and Smart Appliances operate.

A Single Smart Meter Can Produce RF Power Density Levels Shown to Cause Biological Effects

The Biological Effects Chart enables a comparison between the RF power densities produced by a Smart Meter, at various distances from that Smart Meter, and the RF power densities that triggered biological effects in the 67 studies.

The power density at 1 meter (3 feet) from a Smart Meter is higher than the power density that triggered biological effects in 50 of the 67 studies.

The power density at 5 meters (16 feet) from a Smart Meter is higher than the power density that triggered biological effects in 26 of the 67 studies.

The power density at 20 meters (66 feet) from a Smart Meter is higher than the power density that triggered biological effects in 14 of the 67 studies.

This distance of 20 meters is likely as far from a Smart Meter as a person can get and still be inside the typical home. So living and sleeping on the side of a home that is farthest from the Smart Meter is helpful but still may not reduce the received power densities to biological insignificance. Further, one or more of the neighbors' Smart Meters may be closer and may thus be the stronger source.

The power density at 100 meters (328 feet) from a Smart Meter is higher than the power density that triggered biological effects in 6 of the 67 studies.

So, even at the distance of a football field from the Smart Meter, the power density received may still be biologically significant

A Single Smart Appliance inside a Home Can Produce RF Power Density Levels Shown to Cause Biological Effects

Unfortunately, the problem of excess exposure to RF radiation will get worse as Smart Appliances are adopted. They contain their own internal RF transmitters and receivers. Those Smart Appliances are designed to communicate with Smart Meters and to report through the Smart Meters to the electric power company. The data the Smart Appliances report will be sufficient for the electric power company to identify which appliances you own, when you use them, and how much power they consume, throughout the day and the night. The electric power company may even be able to turn the Smart Appliances off by sending a wireless signal to the Smart Meter that is then transferred to the Smart Appliances, but that is less certain at this time.

A Single Smart Meter on a Neighbor's Home Can Produce RF Power Density Levels Shown to Cause Biological Effects

For some locations in a given home, the distance to a neighbor's Smart Meter may be less than the distance to the resident's own Smart Meter. Thus, a neighbor's Smart Meter may be the principal source of radiation for some locations in the given home. The Biological Effects Chart shows that a single Smart Meter can produce RF power densities found to cause biological effects even at distances greater than 20 meters, and certainly up to 100 meters. And the number of neighbors within that range can be large. A given single family home in a residential community may have one to eight nearest neighbors, and even more next nearest neighbors, all within 100 meters (328 feet) of a given home, and each with a Smart Meter

The problem of exposure from the neighbors' Smart Meters becomes more serious as the distances between adjacent homes, and thus the distances between adjacent Smart Meters, get smaller. So, generally speaking, residents of townhouses will receive more radiation from their neighbors' Smart Meters than residents of single family homes. And residents of apartments will receive even more radiation from their neighbors' Smart Meters, depending on the location of the Smart Meters in the apartment buildings.

So Smart Meters are a community concern, not just an individual concern. To resolve the problems of RF exposure for a given home, it will be necessary to address all of the Smart Meters near that home. Smart Appliances, too, contribute to this concern. While, individually, they have a lower RF power output than a Smart Meter, the Smart Appliances of neighbors can also increase the RF exposure in the given home.

RF Radiation May Affect Unborn and Very Young Children More Severely than Adults

The BioInitiative 2012 Report presents evidence that unborn and very young children may be more greatly affected by RF radiation than adults because unborn and very young children are in "critical phases of growth and development".39

Concern for unborn and very young children is shared by the American Academy of Pediatrics (AAP) which wrote to the U.S. Congress in support of a bill before the U.S. House of Representatives (H.R. 6358).40 This bill would fund development of better founded RF exposure limits to protect against cell phones and other wireless sources of RF radiation. The AAP made the following statement:

The AAP strongly supports H.R. 6358's emphasis on examining the effects of radiofrequency (RF) energy on vulnerable populations, including children and pregnant women. In addition, we are pleased that the bill would require the consideration of those effects when developing maximum exposure standards. Children are disproportionately affected by environmental exposures, including cell phone radiation. The differences in bone density and the amount of fluid in a child's brain compared to an adult's brain could allow children to absorb greater quantities of RF energy deeper into their brains than adults. It is essential that any new standards for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded through their lifetimes.

Smart Meters and Smart Appliances operate in the same frequency ranges as cell phones. Further, Smart Meters have twice the RF power output of the typical cell phone, as shown in the table below, and will be transmitting day and night. Emerging Smart Appliances will likely have about oneZfifth the RF power output of the typical cell phone. But a given home may have several Smart Appliances; and they, too, will be transmitting day and night.

http://emfsafetynetwork.org/wp-content/uploads/2013/08/Biological-Effects-From-RF-Radiation-and-Implications-for-Smart-Meters-June-5-2013-2.pdf

Cell Phones & Cell Towers

Cell Phone Use in Children and Teens Translates To 5 Times Greater Increase in Brain Cancer

If today's young people don't reduce their use of wireless mobile devices, they may suffer an "epidemic" of the disease in later life. Research indicates children and teenagers are five times more likely to get brain cancer if they use mobile phones.

At least nine out of ten 16-year-olds have their own handset, as do more than 40 percent of primary schoolchildren.

Many scientists have claimed that the wave of mobile communications made popular in the last two decades will result in long-term health implications worldwide. An unprecedented level and frequency of tumor growth inside the human brain may be inevitable.

Yet investigating dangers to the young were been omitted from a massive investigation of the risks of cancer from using mobile phones, even though the official Mobile Telecommunications and Health Research (MTHR) Programme — which is conducting it — admits that the issue is of the "highest priority".

Mobile phone owners were urged to limit their use after the World Health Organization admitted they may cause cancer.

Despite recommendations of an official report that the use of mobiles by children should be "minimized", the Government has done almost nothing to discourage it.

Minister across Europe have been encouraged to bring in stricter limits for exposure to radiation from mobile and cordless phones, Wi-fi and other devices, partly because children are especially vulnerable to them. They are more at risk because their brains and nervous systems are still developing and because — since their heads are smaller and their skulls are thinner — the radiation penetrates deeper into their brains.

Neurosurgeon and researcher Dr. Leif Salford has conducted many studies on radio frequency radiation and its effects on the brain. Dr. Salford called the potential implications of some of his research "terrifying." Some of the most concerning conclusions result from the fact that the weakest exposure levels to wireless radiation caused the greatest effect in causing the blood brain barrier to leak.

Since he began his line of research in 1988, Dr. Leif Salford and his colleagues at Lund University Hospital in Sweden has exposed over 1,600 experimental animals to low-level radiation. Their results were consistent and worrisome: radiation, including that from cell phones, caused the blood-brain barrier–the brain's first line of defense against infections and toxic chemicals–to leak.

Swedish research reported at the first international conference on mobile phones and health stemmed from .further analysis of data from one of the biggest studies carried out into the risk that the radiation causes cancer, headed by Professor Lennart Hardell of the University Hospital in Orebro, Sweden. Professor Hardell told the conference — held at the Royal Society by the Radiation Research Trust — that "people who started mobile phone use before the age of 20" had more than five-fold increase in glioma", a cancer of the glial cells that support the central nervous system. The extra risk to young people of contracting the disease from using the cordless phone found in many homes was almost as great, at more than four times higher.

Those who started using mobiles young, he added, were also five times more likely to get acoustic neuromas, benign but often disabling tumors of the auditory nerve, which usually cause deafness.

By contrast, people who were in their twenties before using handsets were only 50 percent more likely to contract gliomas and just twice as likely to get acoustic neuromas.

Professor Hardell told the IoS: “This is a warning sign. It is very worrying. We should be taking precautions.” He believes that children under 12 should not use mobiles except in emergencies and that teenagers should use hands-free devices or headsets and concentrate on texting. At 20 the danger diminishes because then the brain is fully developed. Indeed, he admits, the hazard to children and teenagers may be greater even than his results suggest, because the results of his study do not show the effects of their using the phones for many years. Most cancers take decades to develop, longer than mobile phones have been on the market.

The research has shown that adults who have used the handsets for more than 10 years are much more likely to get gliomas and acoustic neuromas, but he said that there was not enough data to show how such relatively long-term use would increase the risk for those who had started young.

He wants more research to be done, but the risks to children will not be studied in the MTHR study, which will follow 90,000 people in Britain. Professor David Coggon, the chairman of the programmes management committee, said they had not been included because other research was being done on young people by a study at Sweden’s Kariolinska Institute.

He said: “It looks frightening to see a five-fold increase in cancer among people who started use in childhood,” but he said he “would be extremely surprised” if the risk was shown to be so high once all the evidence was in.

But David Carpenter, dean of the School of Public Health at the State University of NewYork — who also attended the conference — said: “Children are spending significant time on mobile phones. We may be facing a public health crisis in an epidemic of brain cancers as a result of mobile phone use.”

A scholarly article on cell phone safety published online in the journalElectromagnetic Biology and Medicine reported the finding that cell phones used in the shirt or pants pocket exceed the U.S. Federal Communications Commission (FCC) exposure guidelines and that children absorb twice as much microwave radiation from phones as do adults.

The paper notes that the industry-designed process for evaluating microwave radiation from phones results in children absorbing twice the cellphone radiation to their heads, up to triple in their brain’s hippocampus and hypothalamus, greater absorption in their eyes, and as much as 10 times more in their bone marrow when compared to adults.

Earlier research on pregnant mothers who use mobile phones has shown they are likely to give birth to kids with behavioral problems, especially if those children start using mobile phones early themselves.

Researchers from the National Institutes of Health have found that less than an hour of cellphone use can speed up brain activity in the area closest to the phone antenna, raising new questions about the health effects of low levels of radiation emitted from cellphones.

The study published in The Journal of the American Medical Association, is among the first and largest to document that the weak radio-frequency signals from cellphones have the potential to alter brain activity.

"The study is important because it documents that the human brain is sensitive to the electromagnetic radiation that is emitted by cellphones," Dr. Volkow said. "It also highlights the importance of doing studies to address the question of whether there are — or are not — long-lasting consequences of repeated stimulation, of getting exposed over five, 10 or 15 years."

https://www.rfsafe.com/cell-phone-use-children-teens-translates-5-times-greater-increase-brain-cancer/

New study reveals 300% Increased brain cancer risk for long-term users of cell phones and cordless phones

A Swedish study on the use of wireless phones, including cell phones and cordless phones, has uncovered a link between electromagnetic radiation exposures and the risk of malignant and non-malignant brain tumors.

Cell phones and cordless phones emit a form of non-ionizing electromagnetic radiation, radiation which can be absorbed by tissues and cells that come into close contact with the phone, e.g., the head and neck. The most conclusive evidence as to the dangers of cell phone and similar radiation exposures come from studies on long-term exposure (ten years or more) like this Swedish study.

300% increased risk for long term users

This new study reveals that people who used cell phones and cordless phones for more than a year were at a 70% greater risk of brain cancer compared to those who used cell phones and cordless phones for a year or less. Those who used cell phones and cordless phones for more than 25 years were found to have a 300% greater risk of brain cancer than those who used cell phones and cordless phones for a year or less.

The total number of hours of cell phone and cordless phone use was found to be as important as the number of years of use. A quarter of the study's subjects were found to have lifetime cell phone or cordless phone use of 2,376 or more hours, which corresponds to about 40 minutes a day over ten years. Heavier users were found to have a 250% greater risk of brain tumors compared to those who'd never used cell phones or cordless phones or used them for less than 39 hours in their lifetime.

Brain cancer risk highest on side of head used to phone

This new study echoes the previous study findings of the decade long 13-nation Interphone study, which found a 180% greater risk of brain cancer among those who used cell phones for 1,640 or more hours in their lifetime. But it also goes further.

In this latest study, for all types of cell phone and cordless phone use, brain cancer risk was found to be greater in the part of the brain where the exposure to cell phone and cordless phone radiation was highest, on the side of the head where people predominantly used their phones.

Wireless safety standards inadequate

Given the consistent results from these studies, public health bodies from around the world are asking that the current wireless safety standards be reviewed.

The World Health Organization (WHO) recently classified radio frequency electromagnetic fields as a Group 2B possible carcinogen. Doctors groups are also sounding the alarm. The American Academy of Environmental Medicine, the International Society of Doctors for the Environment (ISDE) and the Irish Doctors Environmental Association (IDEA) are all calling for improved standards.

In the absence of sufficiently protective standards and legislation, individuals need to act now. This means:

- Limiting calls to those that are absolutely necessary on wireless devices
- Using a speaker phone or air tube headset whenever possible
- Keeping cell phones away from the body
- Turning your cell phone off when not in use
- Texting instead of talking
- Alternating from one side of the head to the other when phoning
- Avoiding using a cell phone when reception is poor
- Using a corded land line whenever possible
- Removing cordless phones from bedrooms

Minimizing the effects of these wireless exposures now instead of later is timely and crucial.

https://www.rfsafe.com/new-study-reveals-300-increased-brain-cancer-risk-long-term-users-cell-phones-cordless-phones/

Brain Cancer Top Killer in Kids: Are Cellphones a Factor?

Brain cancer is now the leading cause of cancer deaths in children, according to a new study. Researchers say a chief reason is that new treatments for leukemia — long the No. 1 killer of kids — have knocked it from the top spot in recent years.

But some studies and experts suggest brain cancer rates in kids may be, in part, tied to the increasing use of cellphones by children and teens, and the rates of brain cancer may increase — perhaps drastically — when they become adults.

"I think that there will be a significant, if not enormous increase in primary brain tumors among young people, but perhaps not until they reach the age of late twenties or even thirties," neurosurgeon Dr. Russell Blaylock tells Newsmax Health.

Children are especially vulnerable to the damage caused by cellphones since their thinner skulls absorb twice the radiation. "This is common sense," says Blaylock, author of The Blaylock Wellness Report newsletter.

"Young people are constantly on cellphones, and young, immature cells are being exposed to radiation 24/7. It's going to affect nervous system function and the reproduction of cells."

Past studies on kids' cellphone use and cancer have been mixed, with most saying there is no danger, but some suggesting a potential risk that requires further study.

Among several widely publicized studies in adults that found no danger from using cellphones, Blaylock notes that some were funded by organizations with financial interests in the cellphone industry, and were conducted for too short a time for changes to be noted.

In addition, he warns that the actual numbers of gliomas — a type of cancerous brain tumor — caused by cellphones may be much higher that reports indicate, especially in adults, because due to problems with reporting, many cases slip through the cracks and are never taken into account.

Blaylock is also concerned about neurological damage.

"Of equal concern is the neurological damage done by the microwave radiation that results in a number of other neurological conditions, such as dementia syndromes, Parkinson's disease, language difficulties, reading problems, vertigo, hearing problems, seizures and progressive neurodegenerative disorders," says Blaylock.

"These may be much more common than brain tumors."

Blaylock warns that we may see a dramatic rise in brain tumors in the next 10 years, fueled by years of heavy usage by youngsters.

"The microwaves emitted by cellphones have been shown to cause DNA damage and induce inflammation — chronic inflammation in tissues eventually leads to cancer in some users," Blaylock said.

"There's growing evidence that cellphones cause cancerous brain tumors in adults.

"I would bet that the microwaves activate microglia in the brain and this triggers immunoexcitotoxicity — one of the main mechanisms of glioma development," he said.

Even though some studies have indicated cellphones are safe, others are troubling:

• In July, a study conducted by the National Toxicology Program (NTP), a branch of the National Institutes of Health, concluded that cellphones were a likely cause of cancer.

The study exposed more than 2,500 rats for two years to the type of radiation people are exposed to when they use cellphones, and found an increase in two types of deadly tumors — gliomas and malignant schwannomas, an extremely rare tumor of the heart.

• Research printed in Electromagnetic Biology & Medicine found that 93 of 100 previous studies concluded that the low-intensity radiofrequency radiation (RFR) cellphones emit can damage DNA and cause cancer.

They determined that using a cellphone for 20 minutes each day for five years increased the risk of one type of brain tumor by 300 percent, and talking on a cellphone for an hour a day for four years increased the risk of some tumors up to 500 percent.

• An animal study from Yale University linked the radiation from cellphones to changes in brain development that could cause hyperactivity.

We have shown that behavioral problems in mice that resemble ADHD are caused by cellphone exposure in the womb," said senior researcher Dr. Hugh S. Taylor, a reproductive specialist.

"The rise in behavioral disorders in human children may be in part due to fetal cellular telephone irradiation exposure," Taylor said.

In addition, a British study found that children who used cellphones risked memory loss, sleeping disorders, and headaches.

"I think we are going to see a tremendous effect from cellphones years from now," Blaylock said.

"Millions of people are susceptible to cancer, degenerative brain disorders like Alzheimer's disease, and other brain diseases from the radiation produced by cellphones," says Blaylock, "and the more the phones are used, the higher the risk.

"The effects on some people will be minimal, but millions of others, especially those who have DNA repair defects, are going to have a significantly higher risk. If you are a part of that 10 or 15 percent of the population who have these defects, your risk is going to be extremely high, and you won't even know it.

"It would be ludicrous to say that cellphone radiation is harmless and has no negative effects. That's nonsense."

http://www.newsmax.com/Health/Headline/brain-cancer-killer-cellphones/2016/09/18/id/748870/

Why You Need to Stop Carrying Your Mobile Phone in Your Pocket or Bra

If you're a man and you carry your mobile phone in your pants pocket, or a woman who tucks her phone into her bra or bra strap… chances are you aren't aware of the damage this practice may be causing. You're not going to hear about it from the cell phone companies who are resisting mounting evidence about the dangers of mobile phone radiation.

Another recent study has demonstrated that cell phones are no friends of testes, the male reproductive organs in which sperm is made. It was shown that when cell phones were in talk mode and located in close proximity to the testes, sperm cells were damaged. The study is alarming because of two key problems…

First, damaged sperm can lead to birth defects and higher incidences of various disabilities, as is the case in a greater than average number of children of older fathers. Second, the scenario tested in the study is a common one. Males who chat using hands free headsets often leave their mobile phones resting in their pockets − in perfect range to cause the testes harm.

Ashok Agarwal, who led the study and is the Director of the Center for Reproductive Medicine at the Cleveland Clinic, states, "We believe that these devices are used because we consider them very safe, but it could cause harmful effects due to the proximity of the phones and the exposure that they are causing to the gonads."

The study consisted of semen samples taken from 32 men who exhibited similar sperm health. The samples were kept at constant temperature and other similar conditions, while being split into a control group and a test group. The test group was placed for an hour within 2.5 cm of a cell phone in talk mode, at 850 MHz, which is perhaps the most common frequency.

The transmissions led to an apparent increase in oxidative stress, with free radicals and oxidants being created at a higher than normal rate and antioxidants being broken down. Agarwal says this stress equates to damaged sperm. Other factors which can cause it include environmental pollutants or infections in the urinary genital tract, he adds.

Do cellphones cause cancer? This is perhaps the greatest area of concern when it comes to cell phone use. Mobile phone radiation *has* been linked to various forms of cancer. Evidence is mounting that prolonged exposure to radiation from cell phones carried on the body can lead to breast and other cancers − at earlier ages than ever.

The World Health Organization has classified mobile phones, and any wireless devices that use microwaves to communicate, as a group 2B risk − which means that they are "possibly carcinogenic to humans." Many believe that the evidence is already strong enough to classify mobile phones as definite cancer causers. They point to the increased incidence of cancer in areas of the body closest to where cell phones are carried and used. For example, testicular cancer in men occurring more frequently in the testes closest to where cell phones are carried.

A pile of research has confirmed that non-ionizing communications radiation in the radio-frequency (RF) microwave spectrum has the same effect on human health as ionizing gamma wave radiation from nuclear reactions. It has been known for about 15 years that microwaves from cell phones and tower transmitters cause damage in human blood cells which results in nuclei splintering off into micronuclei fragments.

An industry study showed that human blood exposure to cell phone radiation had a 300% increase in genetic damage in the form of micronuclei. This suggests a health threat much greater than that of smoking or asbestos exposure. The development of micronuclei is a pre-cancerous condition that can quickly develop into full blown cancer.

Research studies have also reported that adults who have used mobile phones for at least ten years experience an increase in brain cancer, salivary gland cancer, and even rare eye cancers on the side of the head where the cell phone was predominantly held.

A recent study completed at Breastlink in California has revealed a strong connection between cell phones placed in the bra and the development of breast cancer in young women. The research team noted that, in the absence of family history or genetic predisposition, breast cancer occurring in women under the age of 40 is uncommon.

The researchers examined the cases of four women, with ages from 21 to 39, who developed multi-focal invasive breast cancer. They focussed on the possible association of these cases with the radiation from electromagnetic field exposures from cellular phones. Each of the women regularly carried her smart phone directly against her breasts tucked into her brassiere for up to ten hours a day, and had been doing so for several years.

Each woman developed tumors in the areas of the breasts immediately underlying the phones. Notably, the women had no family history of breast cancer, tested negative for the BRCA1 and BRACA 2 genes associated with breast cancer development, and had no other known breast cancer risks.

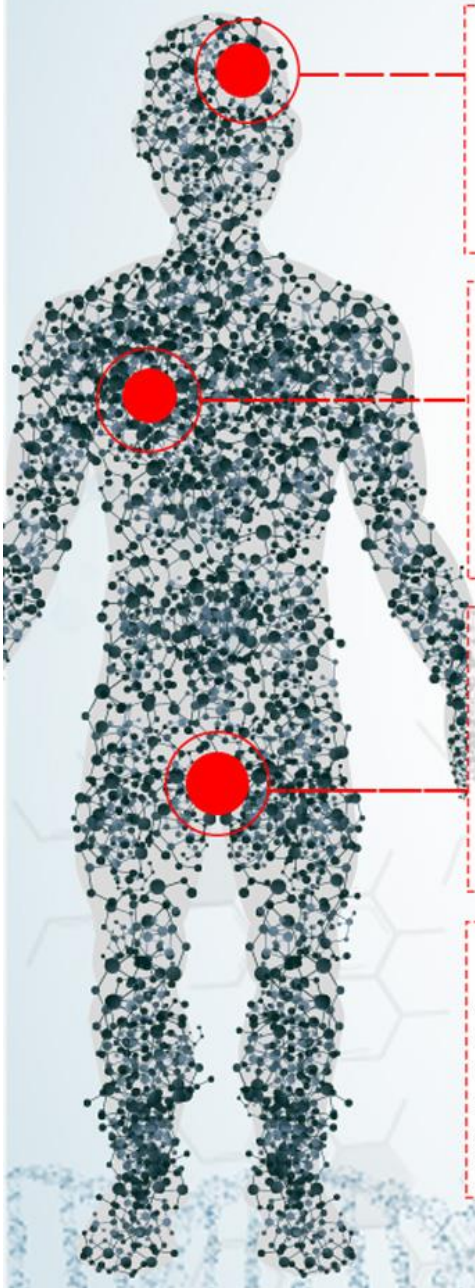
A review of their breast images showed clustering of multiple tumor foci in the breast directly under the area of phone contact. The pathology reports of all four women revealed striking similarity:

- All tumors were hormone-positive
- All tumors were low-intermediate grade
- All tumors showed an extensive intraductal component
- All tumors revealed almost identical form and structure, and specific structural features

Breast surgeon Dr. John West told TV station KTVU that *"young breasts in the early evolution are more sensitive to changes that might lead to cancer."* Dr. West and others have also pointed out that men too are getting breast cancer by carrying cell phones in their shirt pockets.

Dangers of Cell Phones

Despite fierce industry resistance, evidence continues to mount about the dangers of cell phones. Following are some of the major areas of health concerns.



Salivary Gland, Brain and Eye Cancer

Research studies report that adults who have used mobile phones for at least 10 years experience an increase in brain cancer, salivary gland cancer, and even rare eye cancers on the side of the head where the cell phone was predominantly held.

Breast Cancer

A recent study has revealed a strong connection between cell phones placed in the bra and the development of breast cancer in young women. Dr. John West and others have pointed out that men too are getting breast cancer by carrying mobile phones in their shirt pockets.

Infertility/Decreased Sperm Counts

A recent study has shown that when cell phones are in talk mode and located in close proximity to the testes (the male reproductive organs in which sperm is made), sperm cells were damaged. Damaged sperm can lead to birth defects and higher incidences of various disabilities.

Other Health Risks

A cell phone is a two-way microwave-radiating device whose long-term use has been associated with glioma, acoustic neuroma, meningioma, salivary gland tumors, eye cancer, testicular cancer and leukemia, along with a wide range of other biological effects.

The TRUTH About CANCER
educate • expose • eradicate

The wireless phone industry has vigorously disputed every study indicating a link between mobile phones and health problems. They have even provided their own studies which purportedly show that cell phones are safe and present no health hazards. Of course, whenever there are huge profits and liabilities at stake, industries typically try to counter harmful evidence. One example is when industry labored for years to keep asbestos and fiberglass off the carcinogens list.

Another example is the tobacco industry disputing and denying for years that smoking caused cancer or other health problems. Stan Glantz, professor of medicine at the University of California at San Francisco and director of the Center for Tobacco Research and Education, compared the cell phone situation right now to the cigarette situation in the 1950s.

"There was enough evidence to be concerned [about cigarettes in the 1950s], but the details were not really nailed," Glantz said. "Cell phone companies have learned from cigarette companies how to contest science, and they're doing it."

Then there is the Word Health Organization (WHO) that sponsored the Interphone Study. First the study was delayed for four years. Then a news embargo was placed on study participants. And finally, instead of reporting proof of cell phone dangers (as had been documented all the way up until just days before the study was finally released), the study instead reported that it found no evidence of cell phone dangers. The findings contradicted the study's evidence as well as the opinions of some study scientists!

In actuality, the Interphone Study did discover that long-term mobile phone usage increased the chance of glioma by 40%, but dismissed the risk because of possible biases and errors. Six of eight Interphone studies found increased risks of glioma, the most common brain tumor, with one study finding a 39% increase.

An Israeli study found heavy users were about 50% more likely to suffer tumors of the parotid salivary gland. Two studies into acoustic neuroma, a tumor of a nerve between the ear and brain, reported a higher risk after using mobiles for ten years. A Swedish report reported the risk as being 3.9 times higher.

Contradicting the study's conclusions, Dr. Elisabeth Cardis of the Centre for Research in Environmental Epidemiology in Barcelona (who led the stud) said: "Overall, my opinion is that the results show a real effect." Bruce Armstrong, another Interphone researcher from the University of Sydney, said: "There is evidence that there may be a risk; Interphone has made that a little stronger."

Why did the study reverse itself at the end? Many observers believe that the study's independence was compromised because the mobile phone manufacturers helped fund the project to the tune of around 5.5 million Euros.

In 2015, a landmark cellphone "Right to Know" law was passed with a unanimous 9-0 vote by the city council of Berkeley, California, home of the world renowned University of California Berkeley and arguably one of the most erudite cities in the world. This was the first safety ordinance of its kind in the United States and requires cell phone makers to include a city-prepared notice letting people know the minimum separation a cell phone must be held from the body to limit radiation exposure.

https://thetruthaboutcancer.com/mobile-phone-radiation/

Why Cell Phone Radiation Danger is Serious – Science Tells the Story

May 5, 2014

Despite what the telecom industry may want us to believe, if we do the research, we find there is now an overwhelming abundance of independent, peer-reviewed studies telling us that cell phone radiation is dangerous for our health. The research links cell phone radiation with many different disorders and diseases.

Cell Phones & Cancer

Researchers of the 2012 BioInitiative Report agree that approximately ten years of cell phone use may lead to tumors. In particular, there are significant studies that directly correlate RF radiation from cell phones with brain tumors.

Studies report that:

- The chance of developing a brain tumor goes up as much as 40% after a decade of cell phone use.
- People are 5 times more likely to develop a brain tumor if they began using a cell phone before the age of 20.
- People have twice the risk of developing the cancer known as "Glioma", if they use their cell phones for half an hour a day for more than a decade.
- People using cell phones for 2000 hours have 240% greater risk for malignant brain tumors.

A significant report was released in 2009 by the International EMF Collaborative, a team of international EMF scientists and activists, entitled "Cell Phones and Brain Tumors: 15 Reasons for Concern, Science, Spin and the Truth Behind Interphone".

Another study by an Israeli research group found that there's recently been a sharp 4-fold increase in malignant tumors of the parotid gland on the side of the face the cell phone users generally hold the phone. Parotid tumors have historically been very rare and have shown up in people after the age of 50. Most cases since 2001 have occurred in people under the age of 20.

Read more on cell phones and cancer.

Cell Phones & Low Sperm Count

Two research teams studying male fertility have discovered a link between low sperm count and RF radiation from cell phones. One study was conducted at the Queen's University in Canada; the other at the Medical University of Graz, in Austria.

Both studies had similar results. Men who reported cell phone use had:

- lower levels of the luteinizing hormone (LH), an important reproductive hormone that is secreted by the pituitary gland in the brain
- higher levels of circulating testosterone

Read more on cell phones & low sperm count.

Cell Phones & Miscarriage

D.K. Li et al published a study in the journal *Epidemiology,* in which they asked over 900 women less than 10 weeks into a pregnancy to wear a monitor for 24 hours to measure exposure to electromagnetic radiation.

When they compared exposure to pregnancy outcome, they found that those with higher peak exposures had an 80 percent increase in the risk of miscarriage. The risk was even higher among women with a history of recurrent pregnancy loss and/or infertility.

Read more on miscarriage and electromagnetic fields.

Cell Phones & Children

It is estimated that more than 31 million children use cell phones daily—close to four hours a day. Cell phone radiation danger to children is especially of concern, as children absorb 50% more radiation than adults do, as their skulls are thinner and smaller, and EMFs penetrate much more deeply into their brains. Also their brains are more conducive to radiation due to the higher water and ion concentration in a developing brain.

Brain Tumors: Brain cancer has now surpassed leukemia as the number one cancer killing children, and many scientists believe this is directly linked to the exponential increases in cell phone use and other wireless devices.

One of the most comprehensive studies testing the cell phone–cancer link on children was conducted by Professor Lennart Hardell et al in Sweden. The results of the study indicate that children and teens are 5 times more likely to get brain cancer if they use cell phones.

Autism: A study conducted in 2009 by Dr. Dietrich Klinghardt on autistic children and their mothers during pregnancy shows significant results, strongly suggesting that

"electromagnetic radiation in the sleeping environment of the mothers during pregnancy, as well as electromagnetic radiation in the sleeping environment of children, may be a key contributing factor—if not a causative one—in neurological impairments in children including autism…"

Tamara Mariea, released findings from more than five years of research on clients with autism that point to cell phone radiation stress as one of the potentially major causes of the explosion of autistic cases in the past two decades.

A recent report has been published on the health effects of EMFs on autistic children, citing over 550 citations.

Behavioral Problems: Researcher Leeka Kheifets and colleagues conducted a study in which they found a link between cell phone usage and behavioral problems in children. The cell phones are either those used by the children themselves or by their mothers while pregnant. A survey in 2008 with more than 13,000 children found that those whose mothers used cell phones during pregnancy were more likely to have behavioral problems like hyperactivity and trouble controlling emotions.

This study is far from being the only one showing that the radiation from cell phones poses a hazard to a developing fetus. Studies have shown that electromagnetic fields in that frequency range can affect their liver enzymes, glands, muscles, hormone balance, and heart and bone marrow.

Read more on cell phones and birth defects.

Read more on children and cell phones.

FCC Standards are Way out of Date

Set back in 1996, FCC standards for wireless devices were based on studies with healthy 6'2", 220 lbs men exposed to RF radiation for short periods of time. This is very different from the situation with cell phones today, in which people—including women, children and people in fragile health—are frequently on cell phones for hours a day.

Furthermore, cell phones in 1996 were very different from those used today. And, very importantly, the kind of radiation damage tested for was thermal—not the non-thermal kind that the researchers today who are concerned about health risks are focusing on.

Cell Phone Radiation Health Symptoms

Many health symptoms due to cell phone radiation show up early on and may precede more serious disorders and diseases. They include:

- Chronic colds & flus
- Headaches and "mind-fog"
- Digestive disorders
- Sleep disturbance
- Memory Loss
- Depression/anxiety
- Chronic pain
- Dizziness

http://www.earthcalm.com/cell-phone-radiation-danger

Only ten minutes on a mobile could trigger cancer, scientists believe

Mobile phones can take as little as ten minutes to trigger changes in the brain associated with cancer, scientists claimed yesterday.

They found even low levels of radiation from handsets interfere with the way brain cells divide. Cell division encourages the growth of tumors.

Although the researchers did not come up with evidence that mobile phone signals are harmful, the findings suggest they could be.

Several major studies have also found no link between mobile use and brain tumors, nor a dramatic rise in cancer rates.

But campaigners insist the discovery undermines official advice that the devices are safe.

The guidance is based on the assumption that the phones emit too little radiation to heat the brain dangerously.

However, the new study by the Weizmann Institute of Science in Israel suggests "nonthermal" radiation could pose a risk.

The Israeli scientists exposed human and rat cells in a laboratory to low-level radiation at 875 megahertz - a similar frequency to the one used in many mobile phones.

Although the radiation was far weaker than emissions from a typical handset, it began to switch on a chemical signal inside the cells within ten minutes, the researchers report in the Biochemical Journal.

The chemical signals they detected were involved in the division of cells.

The researchers say the reaction was not caused by heating and claim they have found a separate way in which mobile phones could damage health.

Dr. Rony Seger, a co-author of the study, told the magazine New Scientist: "The significance lies in showing cells do react to cellphone radiation in a non-thermal way."

Although changes in the chemical pathway seen by the Israeli scientists have been linked to several cancers, the researchers say there was no sign of a cancer-causing effect.

Dr. Simon Arthur, a health expert at Dundee University, said the effect was 'unlikely to cause cancer'.

Dr. Dariusz Leszczynski, of the Radiation and Nuclear Safety Authority in Helsinki, said: "If cell-phone radiation cannot induce biological effects then there will never be any health effects.

"On the other hand if we can show this radiation is able to induce biological effects then we have a different story."

A major review of mobile phone safety is due to be published by the Health Protection Agency next month.

The agency's last major report, in 2004, found no evidence mobiles were a serious health risk. It did, however, caution against excessive use, especially by the young.

Dr. Michael Clark, a spokesman for the agency, said: "Because of findings like this that pop up from time to time, a precautionary approach is justified."

Graham Philips, of campaign group Powerwatch, said: "Safety guidelines assume health effects from mobiles can only occur when significant heating of body tissue occurs.

"This study shows biological changes in response to low-level mobile phone radiation - something that could potentially have implications for health.

"Further research is required, however guidance based purely on thermal effects is clearly out of date."

http://www.dailymail.co.uk/news/article-478614/Only-minutes-mobile-trigger-cancer-scientists-believe.html

Cell Phones and Health - California Department of Public Health

Document released pursuant to Moskowitz v. CDPH, Sac. Super. Ct. No. 34-2016-80002358

Cell phones, like other electronic devices, emit a kind of energy called radiofrequency EMFs (electromagnetic fields). Health officials are concerned about possible health effects from cell phone EMFs because some recent studies suggest that long-term cell phone use may increase the risk of brain cancer and other health problems. For those concerned about possible health problems, this fact sheet provides information about how to lower exposure to EMFs from cell phones.

EMFs are types of radiation. They are created by all electronic devices. Some devices, such as watches, create weak EMFs that are considered harmless. Others, like X-ray machines, generate very strong EMFs that can damage cells and tissues, and cause cancer and other health effects. This is why we try to only use X-rays when necessary. Cell phones make relatively weak EMFs, somewhat less than those from microwave ovens, but because they are used frequently and kept close to the head and body, cell phone EMFs can affect nearby cells and tissues.

Several studies have found that people with certain kinds of brain cancer were more likely to have used cell phones for 10 years or more. Most of the cancers were on the same side of the head that people usually held their phones. Although the chance of developing brain cancer is very small, these studies suggest that regular cell phone use increases the risk of developing some kinds of brain cancer. Some studies have also linked exposure to EMFs from cell phones to fertility problems. As more studies are done and we learn more about possible risks for cancer and other health problems linked to cell phone use, the recommendations on this fact sheet may change.

Your exposure to cell phone EMFs depends mostly on your distance from the phone, the strength of the EMF, and how long and how often you use the phone. The farther away the phone is from your body, the lower the exposure. Your cell phone produces stronger EMFs at the start of a call, when it is trying to connect to a cell tower, and also when only one or two bars are showing. Your phone also emits stronger EMFs when used in a moving car, bus, or train, as the phone switches connections from one cell tower to another. Finally, some phones produce stronger EMFs than others.

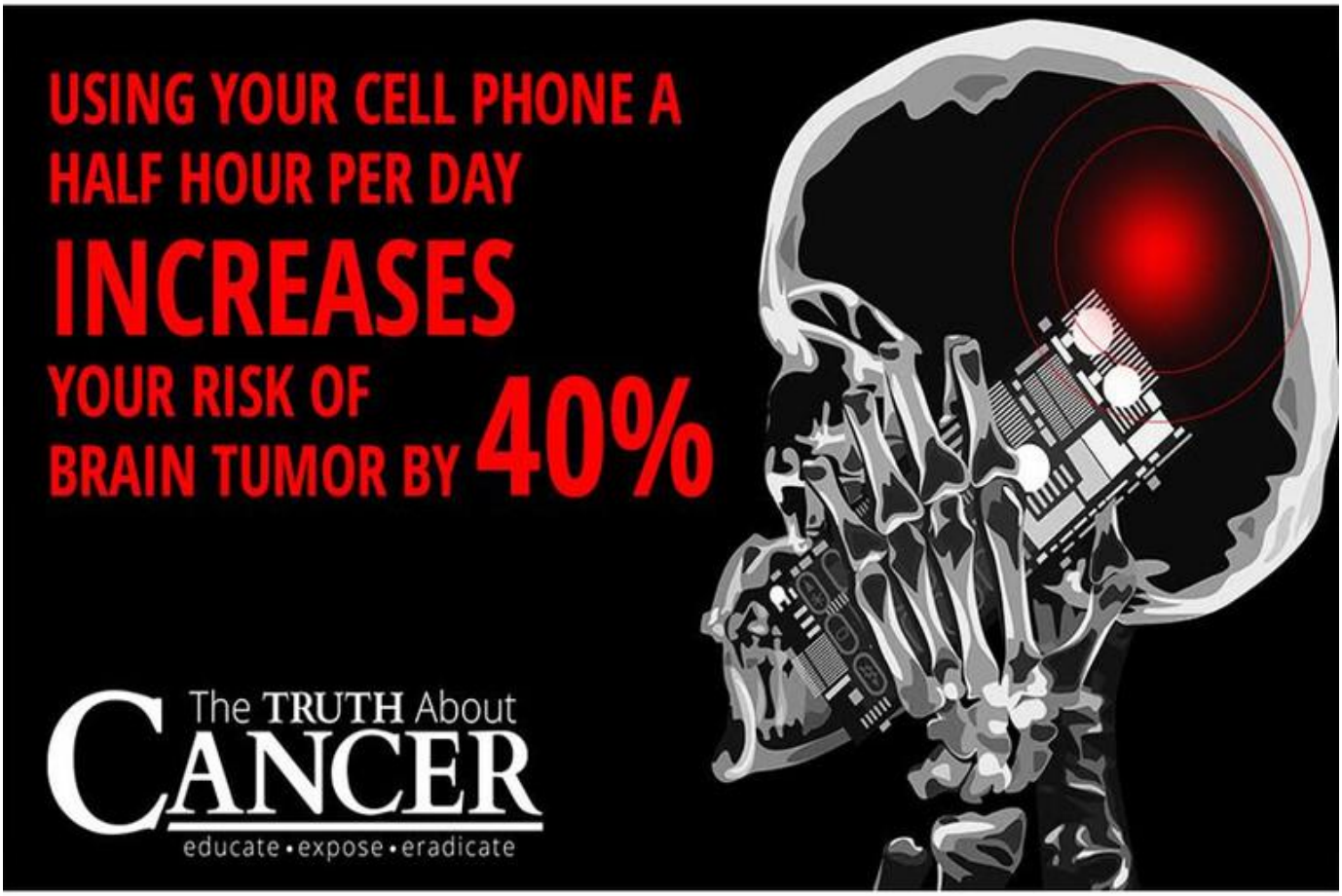
To lower your exposure to EMFs from cell phones: Increase the distance between you and your phone by: • Using the speaker phone. • Sending text messages. • Use a headset and carry your phone away from your body. EMFs from wireless (Bluetooth) and wired headsets are usually weaker than those from a cell phone. • Keep your phone away from your body. A cell phone that is on can emit EMFs even when it is not being used. Do not sleep with your cell phone near you or carry it in a pocket or directly on your body unless the phone is turned off. Limit your cell phone use when reception is weak or increase the distance between you and the phone. When your phone shows only one or two bars, it is emitting stronger EMFs than when three, four, or five bars are showing. Reduce the amount of time spent talking on a cell phone. • Keep cell phone calls short, even when using a wireless or wired headset. • Use speaker phone mode or a corded phone for longer conversations. Corded phones produce very weak EMFs. Take off your headset when you're not on a call. Wireless and wired headsets emit EMFs even when you are not using your phone. Do not rely on devices that claim to shield or neutralize EMFs from cell phones. These devices have not been shown to reduce exposures.

EMFs can pass deeper into a child's brain than an adult's. Also, the brain is still developing through the teen years, which may make children and teens more sensitive to EMF exposures. For these reasons,

parents may want to limit their child's cell phone use to texting, important calls, and emergencies. Pregnant women, children, and teens can also follow the tips for reducing exposure listed above.

http://www.sfchronicle.com/file/198/6/1986-Cell%20Phones%201-26-15.pdf

How Safe is Your Cell Phone?



Apple™ states "The new AirPods offer a game-changing listening experience. Designed with a huge amount of forward-thinking technology inside a tiny device, these wireless headphones combine crystal clear sound with a new sense of freedom."

While this innovation delights tech enthusiasts, prominent public health experts are raising the alarm with regard to the broader issue of microwave cell phone radiation.

Why the concern?

Simply, there is a growing body of scientific evidence that wireless microwave radiation is potentially harmful to human health, including damage to DNA, leakage of the blood-brain barrier, cognitive impairment and cardiac symptoms.

How can this be?

Surely there are safety standards limiting our exposure and manufacturers must comply? And someone is monitoring the rapid rise of Wi-Fi and other digital technology for adverse health effects?

After more than a decade studying and writing about this issue, it seems clear to me the accuracy of safety standards is a key factor.

This is why experts, including Dr. Martin Blank – a cell biologist who published more than two hundred peer-reviewed studies while a professor at Columbia University – are calling for a review of these standards.

Dr. Blank cautions, "We don't feel this radiation and we think it's not doing anything, but it's a very potent biological agent and government safety standards are irrelevant. There is evidence of harm; the standards are not protecting us."

"Government regulators are just plain wrong". The environmental health physician, Dr. David Carpenter, made that hard-hitting statement.

"Irrelevant", "Just plain wrong"?

This is because the standards are set only for radiation powerful enough to heat human tissue. They do not consider the 'low' levels emitted by Wi-Fi, mobile phones and wireless headsets.

While these levels do not heat human tissue, there is significant evidence of harm. Pregnant women, children and youth are especially at risk.

Proximity is a crucial factor, as the strength of this radiation drops off dramatically at distance. This is why experts strongly advise keeping all mobile devices as far as possible away from the body, especially keeping mobile phones away from the head and vulnerable brain tissue.

(You can imagine my distress when I see a pregnant woman resting an iPad or mobile phone on her belly, or see young children on these wireless devices.)

So, back to headphone jacks: wired headsets are considered essential if you want to reduce your risk when using a mobile phone.

Joel Moskowitz, PhD, Director, Center for Family & Community Health School of Public Health University of California, Berkeley is a leading expert in this field. He reported recently, "Apple's new AirPods are wireless earbuds that employ Bluetooth technology to communicate with your smart phone, laptop, or smart watch. If one uses the AirPods many hours a day, the cumulative exposure to the brain from this microwave radiation could be substantial."

Dr. Moskowitz goes on to refer to the risks to the brain from exposure to Bluetooth radiation and the risks of higher levels of radiation.

The concern is also that the user does not have the option of limiting their exposure with a wired headset. This is similar with iPads – even if you want to opt for a safer wired internet connection, you can't do this, as there is no input jack – it can only be connected wirelessly.

Here is an excerpt from my book, A Wellness Guide for The Digital Age, with advice from technical expert Rob Metzinger of Safe Living Technologies:

Headsets, Earpieces – Safer Solutions:

Here is a summary of headset options – worst to best:

Worst – Cell phone held against your head, up to your ear, using a wireless headset, then a conventional wired headset.

Better – The air tube headset is non-conductive thus separating you from the wires and speaker. This makes it better than a wired headset, and certainly much better than a wireless one. For best results, ensure the phone is at a distance and you are not in contact with the wire or the phone. Note: compatible adapters for your particular model of mobile phone may be challenging to find.

NativeUnion.com makes this 'Retro' POP handset for mobiles; it looks just like a corded phone handset and plugs into your mobile phone, or computer, to reduce radiation exposure. The bluetooth model is not advised.

Best – Using a phone with a good quality speaker (away from the body without contacting it) is a safer option but most speakers are poor quality sound and don't allow privacy. This is where the air tube headset comes into play. Note: these steps reduce radiation but mobiles are still not safe.

Safe – Standard landline phone; choose the corded phone. (If you are electro-sensitive, use the speaker function on the landline.)" Switch from cell/cordless phones to corded landlines to maintain your health. Best: one with batteries, not plugged into a wall socket."

Of course, this advice is falling on mostly deaf ears. At a seminar recently someone asked me, "What's a landline?"

https://kashmirobserver.net/2016/features/how-safe-your-cell-phone-11453

Apple's new 'wireless' headphones emit radiation ... right next to your brain

To much fanfare and excitement, Apple has announced that the iPhone 7 will come with wireless earbuds, ditching the much-reviled and ever-tangled cords of conventional earbuds. The wireless earbuds, dubbed "AirPods," will be water-resistant and are, in the words of company CEO Tim Cook, the first step to a "wireless future."

They will also fire dangerous, cancer-causing radiation directly into the brains of users, experts have warned.

The iPhone will communicate via Bluetooth directly with the right earbud, which will send a separate Bluetooth signal to the left earbud. This means the radiation carrying the signal will pass directly through the user's brain.

According to Apple, all Bluetooth devices emit radiofrequency radiation (RFR) within the guidelines set by the Federal Communications Commission (FCC). But according to Joel Moskowitz of the UC Berkeley School of Public Health, more than 200 scientists who study the effects of electromagnetic fields on the body have gone on record criticizing the FCC guidelines as far too lenient.

"We are playing with fire here," Moskowitz said. "You are putting a microwave-emitting device next to your brain."

The public health implications of people doing this on a massive scale are daunting, Moskowitz and other experts have warned.

Traditionally, scientists have claimed that RFR does not carry enough energy to cause cellular or DNA damage -- in contrast to the more high-energy ionizing radiation, such as X-rays, that has been shown to cause cancer.

Yet ionizing or not, a large body of research continues to show negative health effects in humans and other animals exposed to RFR.

"This has been observed over several decades," Moskowitz said. "It's like we keep rediscovering that Bluetooth is harmful and trying to forget it because we don't know how to handle it from a policy standpoint."
Contrary to the claims of industry representatives, studies have in fact established ways that RFR leads directly to health harm.

For example, RFR has been shown to degrade the blood-brain barrier, thereby allowing more toxins to pass into the brain. This is a major concern with placing RFR transmitters directly next to the brain.

"Although we don't know the long-term risks from using Bluetooth devices, why would anyone insert microwave-emitting devices in their ears near their brain when there are safer ways to use a cell phone?" Moskowitz said. "Essentially I recommend using corded headsets or hands-free use of cell phones, not wireless ear buds."

But even without Bluetooth, any cell phone use is hazardous. Cell phones also operate using RFR signals, as do smart meters and wireless networking.

Another mechanism by which RFR can cause health problems -- including cancer -- was identified in a 2015 study published in the journal Electromagnetic Biology & Medicine. The researchers found that numerous prior studies have shown that RFR can induce oxidative stress, a condition in which the body's antioxidant defenses are overwhelmed and free radicals run amok.

Free radicals are molecules that damage cells and DNA, and are considered among the major causes of cancer, heart disease, dementia, and numerous other health problems.

Indeed, all studies that have shown health concerns with cell phone radiation apply equally to Bluetooth, and therefore to Apple's AirPods. Thus, iPhone 7 purchasers should be concerned about the findings of the 2010 industry-funded Interphone study, which found dramatic increases in the risk of brain tumors, acoustic nerve tumors and parotid gland tumors among people who had used cell phones for 10 years or more -- and even higher risks among those who started using phones before age 20.

Earlier this year, scientists from across the United States gathered at a pediatric conference in Baltimore to declare that there is no longer a debate about the cell phone-brain cancer link.

"The weight of the evidence is clear: cell phones do cause brain cancer," said Dr. Devra Davis, president of the Environmental Health Trust.

http://www.naturalnews.com/055296_iPhone_wireless_headphones_brain_cancer.html

Major cell phone radiation study reignites cancer debate

Federal scientists released partial findings Friday from a $25-million animal study that tested the possibility of links between cancer and chronic exposure to the type of radiation emitted from cell phones and wireless devices. The findings, which chronicle an unprecedented number of rodents subjected to a lifetime of electromagnetic radiation starting in utero, present some of the strongest evidence to date that such exposure is associated with the formation of rare cancers in at least two cell types in the brains and hearts of rats. The results, which were posted on a prepublication Web site run by Cold Spring Harbor Laboratory, are poised to reignite controversy about how such everyday exposure might affect human health.

Researchers at the National Toxicology Program (NTP), a federal interagency group under the National Institutes of Health, led the study. They chronically exposed rodents to carefully calibrated radio-frequency (RF) radiation levels designed to roughly emulate what humans with heavy cell phone use or exposure could theoretically experience in their daily lives. The animals were placed in specially built chambers that dosed their whole bodies with varying amounts and types of this radiation for approximately nine hours per day throughout their two-year life spans. “This is by far—far and away—the most carefully done cell phone bioassay, a biological assessment. This is a classic study that is done for trying to understand cancers in humans,” says Christopher Portier, a retired head of the NTP who helped launch the study and still sometimes works for the federal government as a consultant scientist. “There will have to be a lot of work after this to assess if it causes problems in humans, but the fact that you can do it in rats will be a big issue. It actually has me concerned, and I’m an expert.”

More than 90 percent of American adults use cell phones. Relatively little is known about their safety, however, because current exposure guidelines are based largely on knowledge about acute injury from thermal effects, not long-term, low-level exposure. The International Agency for Research on Cancer in 2011 classified RF radiation as a possible human carcinogen. But data from human studies has been “inconsistent,” the NTP has said on its website. Such studies are also hampered by the realities of testing in humans, such as recall bias—meaning cancer patients have to try to remember their cell phone use from years before, and how they held their handsets. Those data gaps prompted the NTP to engage in planning these new animal studies back in 2009. The researchers found that as the thousands of rats in the new study were exposed to greater intensities of RF radiation, more of them developed rare forms of brain and heart cancer that could not be easily explained away, exhibiting a direct dose–response relationship. Overall, the incidence of these rare tumors was still relatively low, which would be expected with rare tumors in general, but the incidence grew with greater levels of exposure to the radiation. Some of the rats had glioma—a tumor of the glial cells in the brain—or schwannoma of the heart. Furthering concern about the findings: In prior epidemiological studies of humans and cell phone exposure, both types of tumors have also cropped up as associations.

In contrast, none of the control rats—those not exposed to the radiation—developed such tumors. But complicating matters was the fact that the findings were mixed across sexes: More such lesions were found in male rats than in female rats. The tumors in the male rats “are considered likely the result of whole-body exposure” to this radiation, the study authors wrote. And the data suggests the relationship was strongest between the RF exposure and the lesions in the heart, rather than the brain: Cardiac schwannomas were observed in male rats at all exposed groups, the authors note. But no “biologically significant effects were observed in the brain or heart of female rats regardless of modulation.” Based on these findings, Portier said that this is not just an associated finding—but that the relationship

between radiation exposure and cancer is clear. "I would call it a causative study, absolutely. They controlled everything in the study. It's [the cancer] because of the exposure."

Earlier studies had never found that this type of radiation was associated with the formation of these cancers in animals at all. But none of those studies followed as many animals, for as long or with the same larger intensity exposures, says Ron Melnick, a scientist who helped design the study and is now retired from the NTP.

The new results, published on Web site bioRXiv, involved experiments on multiple groups of 90 rats. The study was designed to give scientists a better sense of the magnitude of exposure that would be associated with cancer in rodents. In the study rats were exposed to RF at 900 megahertz. There were three test groups with each species of each sex, tested at different radiation intensities (1.5, three and six watts per kilogram, or W/kg), and one control group. (The lowest-intensity level roughly approximates the levels allowed by U.S. cell phone companies, which is 1.6 W/kg.) "There are only 90 animals per group, so because there is a trend—and this is the purpose of these assays where you do multiple doses you extrapolate downward and calculate a risk for humans from those trends—so that information is useful. Probably what caused cancer at the high doses will cause cancer at lower doses but to a lesser degree," Portier says.

Rodents across all the test groups were chronically exposed to RF for approximately nine hours spread out over the course of the day. (Their entire bodies were exposed because people are exposed to such radiation beyond their heads, especially when they carry them or store them in their bras, says John Bucher, the associate director of the NTP.) During the study the rats were able to run around in their cages, and to eat and sleep as usual. The experiments also included both types of modulations emitted from today's cell phones: Code Division Multiple Access and Global System for Mobile. (Modulations are the way the information is carried, so although the total radiation levels were roughly the same across both types, there were differences in how radiation is emitted from the antenna—either a higher exposure for a relatively short time or a lower exposure for a longer time.) Overall, there was no statistically significant difference between the number of tumors that developed in the animals exposed to CDMA versus GSM modulations. With both modulations and tumor types, there was also a statistically significant trend upward—meaning the incidence increased with more radiation exposure. Yet, drilling down into the data, in the male rats exposed to GSM-modulated RF radiation the number of brain tumors at all levels of exposure was not statistically different than in control males—those who had no exposure at all. "The trend here is important. The question is, 'Should one be concerned?' The answer is clearly 'Yes.' But it raises a number of questions that couldn't be fully answered, " says David Carpenter, a public health clinician and the director of the Institute for Health and the Environment at the University at Albany, S.U.N.Y.

The findings are not definitive, and there were other confusing findings that scientists cannot explain—including that male rats exposed to the radiation seemed to live longer than those in the control group. "Overall we feel that the tumors are likely related to the exposures," says Bucher, but such unanswered questions "have been the subject of very intense discussions here."

The NTP released the partial findings on Friday after an online publication called *Microwave News* reported them earlier this week. The program will still be putting out other results about the work in rats and additional findings about similar testing conducted in mice. The NIH told *Scientific American* in a statement, "This study in mice and rats is under review by additional experts. It is

important to note that previous human, observational data collected in earlier, large-scale population-based studies have found limited evidence of an increased risk for developing cancer from cell phone use." Still, the NTP was clearly expecting these findings to carry some serious weight: Ahead of Friday's publication the NTP said on its Web site that the study (and prior work leading to these experiments) would "provide critical information regarding the safety of exposure to radio-frequency radiation and strengthen the science base for determining any potential health effects in humans."

In response to media queries, cell phone industry group CTIA–The Wireless Association issued a statement Friday saying that it and the wireless industry are still reviewing the study's findings. "Numerous international and U.S. organizations including the U.S. Food and Drug Administration, World Health Organization and American Cancer Society have determined that the already existing body of peer-reviewed and published studies shows that there are no established health effects from radio frequency signals used in cellphones," the CTIA statement said.

The Federal Communications Commission, which had been briefed by NIH officials, told *Scientific American* in a statement, "We are aware that the National Toxicology Program is studying this important issue. Scientific evidence always informs FCC rules on this matter. We will continue to follow all recommendations from federal health and safety experts including whether the FCC should modify its current policies and RF exposure limits."

This animal study was designed primarily to answer questions about cancer risks humans might experience when they use phones themselves, as opposed to smaller levels of exposure from wireless devices in the workplace or from living or working near cell phone towers. But it may have implications for those smaller levels as well, Portier says.

The findings shocked some scientists who had been closely tracking the study. "I was surprised because I had thought it was a waste of money to continue to do animal research in this area. There had been so many studies before that had pretty consistently not shown elevations in cancer. In retrospect the reason for that is that nobody maintained a sufficient number of animals for a sufficient period of time to get results like this," Carpenter says.

Exposing rodents to radiation for this type of experiment is a tricky business. First, scientists need to be able to calculate exactly how much the rats should be exposed to relative to humans. Too much exposure would not be a good proxy for human use. And with finely calculated low-level exposure rates, scientists still need to be sure they are not going to heat the animals enough to kill them or to cause other health problems. (Subsequent work will be published on the animals' temperatures.)

The fact that scientists were able to expose animals to nonionizing radiation (like that emitted by cell phones) and those animals went on to develop tumors but that exposure did not significantly raise the animals' body temperatures was "important" to release, Bucher says.

There are safety steps individuals can take, Carpenter says. Using the speakerphone, keeping the phone on the desk instead of on the body and using a wired headset whenever possible would help limit RF exposure. "We are certainly not going to go back to a pre-wireless age," he says. But there are a number of ways to reduce exposure, particularly among sensitive populations."

http://www.salon.com/2016/05/29/it_actually_has_me_concerned_and_im_an_expert_major_cell_phone_radiation_study_reignites_cancer_debate_partner/

Cell Phone Companies Are Panicking Over New Study Linking Cell Phone Use And Cancer

It is no longer speculation. Cellphone radiation poses a cancer risk for humans, the U.S. National Toxicology Program (NTP) reported in March 2016. The article comes as government issues its warning to the public following a $25 million study that rats exposed to GSM or CDMA signals for two-years were at a statistically significant higher risk of cancer.

Since everyone in America is exposed to wireless radiation almost all the time, NTP senior managers think the public should be aware that their cellphones may cause brain tumors.

In the past, many doctors, biologists, government officials, and other professionals believe that cancer from cellphone radiation was impossible. But their faulty view was based on a lack of evidence to connect the two. But now that an established mechanism for RF radiation from cellphones has been documented, these claims no longer seem valid.

For example, the same week these findings were released, a Michigan medical doctor wrote in an opinion piece for the Wall Street Journal: “There is no known mechanism by which mobile phones might cause brain tumors.” He seems to be wrong.

According to the NTP findings, as the intensity of the radiation increases, so does the incidence of cancer among the lab rats.

While rats got cancer, no effect was observed on mice.

Rats were exposed to different exposure levels as well as two different kinds of cell phone radiation.

Rats exposed to cellphone radiation were found to have higher rates of two types of cancer.

The first, glioma, is a tumor of the glial cells in the brain. The second was malignant schwannoma of the heart which is very rare and dangerous.

None of the rats not exposed to cellphone radiation developed either type of cancer.

“The NTP tested the hypothesis that cell phone radiation could not cause health effects and that hypothesis has now been disproved,” Ron Melnick, who led the team that designed the NTP study, said in a telephone interview. “The experiment has been done and, after extensive reviews, the consensus is that there was a carcinogenic effect.”

The safety of cellphones has been a heated debate for more than two decades. But in 2011 when the International Agency for Research on Cancer classified cellphones as a possible human carcinogen.

“This is a major public health concern because the cells which became cancerous in the rats were the same types of cells as those that have been reported to develop into tumors in cell phone epidemiological studies,” Melnick added. “For this to be a chance coincidence would be truly amazing.”

The NTP radiation study was conducted for more than a decade and had a $25 million budget.

http://awm.com/cell-phone-companies-are-panicking-over-new-study-linking-cell-phone-use-and-cancer/

New Expert Warning: Claims That Cellphones Are Safe 'Endanger Public Health' and Are 'Ludicrous'

The widely publicized article claiming that cell phones are safe by the Australian sociologist Simon Chapman contains a number of major errors and cherry-picked data, according to newly published critiques by Environmental Health Trust scientists.

In a series of newly published articles, Environmental Health Trust experts reject a widely-publicized article asserting no connection between brain cancer and mobile phones. Experts say the article published in Cancer Epidemiology by the Australian sociologist Simon Chapman contains a number of errors, false assumptions and cherry-picked data and are calling upon the journal's editor-in-chief to retract the article.

These newly published appraisals (Bandara 2016, Morgan 2016, Wojcik 2016) debunk the claim by Chapman et al that "After nearly 30 years of mobile phone in Australia among millions of people, there is no evidence of any rise in any age-group that could be plausibly attributed to mobile phones."

"Given the radical changes in uses and users of phones today, arguing that the absence of a general epidemic of brain cancer today is proof of safety is ludicrous. Average rates of cancer cannot show us what's happening in the youngest age groups where rates are rising rapidly," adds Devra Lee Davis. "By showing only that part of the data that supports his view, Chapman is playing fast and loose with science and putting us all at grave risk," she adds. "He basically ignores rising brain cancer rates in the U.S. and Australia that have grown rapidly in those under age 65 that have incurred the greatest use of phones for the longest time. Instead he points to the lack of an overall population increase in the disease as proof phones have no effect."

"The assertion that mobile phones are safe is a massive disservice to global public health," says Dr. Anthony B. Miller, senior advisor to the World Health Organization. "New studies from the U.S National Toxicology Program confirm that animals develop the same tumors of the brain that are increased in the heaviest regular cell phone users. We cannot afford to treat people like lab rats and must take steps to reduce exposures at this time, while continuing to study the issue in a serious manner."

"Chapman has Cherry-picked his data," notes L. Lloyd Morgan senior scientist with EHT. "For example, the paper referred an Australian paper that had reported a large increase in brain cancer, 'found an increase in incidence of the aged 65 and over,' but fail to the report the full statement from that same paper: "A significant increasing incidence in glioblastoma multiforme (GBM) was observed in the study period [2000-2008] (annual percentage change [APC] 2.54; 95% confidence interval [CI] 0.4-4.6, n =2275), particularly after 2006. In GBM patients in the [under age] >65-year group, a significantly increasing incidence both for men and women …' Invoking only those data that support his view and ignoring information from the same paper that contradicts his view is a ludicrous and dangerous method of analysis.

Additional concerns are raised about the Chapman report by clinical director and forensic expert Damian Wojcik of New Zealand who adds that the Chapman fails to take into account evidence that the locations of brain tumors that are increasing in the young are precisely those to be expected to be associated with mobile phones. Recent report from the National Cancer Institute Surveillance End-Result

and Epidemiology program confirm that brain cancers located in the cerebellum and frontal and temporal lobe (front and sides of the head where cell phone radiation penetrates the skull) have increased in younger Americans.

The scientist's also point out that Chapman does not analyze information on actual minutes of mobile phone use by a person, but estimates this based only on the number of mobile phone subscriptions.

"It is irresponsible to give assurances on microwave/radiofrequency radiation (from wireless devices) based on just cell phone subscriptions as Chapman does, while ignoring a solid and growing body of scientific studies showing serious health problems in those studies that have information on actual cell phone use," states Dr. Pri Bandara, an Australian clinical researcher, pointing to several research studies indicating increased risk in people who used cell phones for more minutes a day than others.

Morgan noted that there is no funding source for the Chapman paper indicated but Chapman worked with the Australian Mobile Telecommunication Association (AMTA) in the past. Professor Chapman published a book with the AMTA and then a paper in a journal which acknowledged "Funding for this study was provided by the AMTA."

http://www.sbwire.com/press-releases/new-expert-warning-claims-that-cellphones-are-safe-endanger-public-health-and-are-ludicrous-720416.htm

Children Can Absorb 10x More Radiation In Their Bone Marrow Than Adults

Not only is sensitivity to electromagnetic radiation emerging as a major health problem in our society, but start creating policies to curb exposure in our youngest generations, the repercussions as they age could be disastrous to our entire health infrastructure.

Many scientists have claimed that the wave of mobile communications made popular in the last two decades will result in long-term health implications worldwide. An unprecedented level and frequency of tumor growth inside the human brain may be inevitable. Mobile phone owners were urged to limit their use after the World Health Organization admitted they may cause cancer.

Neurosurgeon and researcher Dr. Leif Salford has conducted many studies on radio frequency radiation and its effects on the brain. Dr. Salford called the potential implications of some of his research "terrifying." Some of the most concerning conclusions result from the fact that the weakest exposure levels to wireless radiation caused the greatest effect in causing the blood brain barrier to leak.

A scholarly article on cell phone safety in the journal Electromagnetic Biology and Medicine reports the finding that cell phones used in the shirt or pants pocket exceed the U.S. Federal Communications Commission (FCC) exposure guidelines and that children absorb at least twice as much microwave radiation from phones as do adults. The paper notes that the industry-designed process for evaluating microwave radiation from phones results in children absorbing twice the cellphone radiation to their heads, up to triple in their brain's hippocampus and hypothalamus, greater absorption in their eyes, and as much as 10 times more in their bone marrow when compared to adults.
Earlier research on pregnant mothers who use mobile phones has shown they are likely to give birth to kids with behavioural problems, especially if those children start using mobile phones early themselves. Exposure to radiation from cell phones during pregnancy affects the brain development of offspring, potentially leading to hyperactivity.

A study published in The Journal of the American Medical Association, is among the first and largest to document that the weak radio-frequency signals from cellphones have the potential to alter brain activity.

"Studies of people have shown that both electrical "extremely low frequency" fields (ELF), and communication "radiofrequency" (RF) exposures result in an increased risk of cancer, and that this occurs at intensities that are too low to cause tissue heating. Unfortunately, all of our exposure standards are based on the false assumption that there are no hazardous effects at intensities that do not cause tissue heating. Based on the existing science, many public health experts believe it is possible we will face an epidemic of cancers in the future resulting from uncontrolled use of cell phones and increased population exposure to Wi-Fi and other wireless devices. Thus it is important that all of us, and especially children, restrict our use of cell phones, limit exposure to background levels of Wi-Fi, and that government and industry discover ways in which to allow use of wireless devices without such elevated risk of serious disease. We need to educate decision-makers that 'business as usual' is unacceptable. The importance of this public health issue cannot be underestimated."
– David Carpenter, MD

http://www.getholistichealth.com/46115/children-can-absorb-10x-more-radiation-in-their-bone-marrow-than-adults/

Your cellphone is killing you: What people don't want you to know about electromagnetic fields

The industry doesn't want to admit it, but the science is becoming clearer: Sustained EMF exposure is dangerous

You may not realize it, but you are participating in an unauthorized experiment—"the largest biological experiment ever," in the words of Swedish neuro-oncologist Leif Salford. For the first time, many of us are holding high-powered microwave transmitters—in the form of cell phones—directly against our heads on a daily basis.

Cell phones generate electromagnetic fields (EMF), and emit electromagnetic radiation (EMR). They share this feature with all modern electronics that run on alternating current (AC) power (from the power grid and the outlets in your walls) or that utilize wireless communication. Different devices radiate different levels of EMF, with different characteristics.

What health effects do these exposures have?

Therein lies the experiment.

The many potential negative health effects from EMF exposure (including many cancers and Alzheimer's disease) can take decades to develop. So we won't know the results of this experiment for many years—possibly decades. But by then, it may be too late for billions of people.

Today, while we wait for the results, a debate rages about the potential dangers of EMF. The science of EMF is not easily taught, and as a result, the debate over the health effects of EMF exposure can get quite complicated. To put it simply, the debate has two sides. On the one hand, there are those who urge the adoption of a precautionary approach to the public risk as we continue to investigate the health effects of EMF exposure. This group includes many scientists, myself included, who see many danger signs that call out strongly for precaution. On the other side are those who feel that we should wait for definitive proof of harm before taking any action. The most vocal of this group include representatives of industries who undoubtedly perceive threats to their profits and would prefer that we continue buying and using more and more connected electronic devices.

This industry effort has been phenomenally successful, with widespread adoption of many EMF-generating technologies throughout the world. But EMF has many other sources as well. Most notably, the entire power grid is an EMF-generation network that reaches almost every individual in America and 75% of the global population. Today, early in the 21st century, we find ourselves fully immersed in a soup of electromagnetic radiation on a nearly continuous basis.

The science to date about the bioeffects (biological and health outcomes) resulting from exposure to EM radiation is still in its early stages. We cannot yet predict that a specific type of EMF exposure (such as 20 minutes of cell phone use each day for 10 years) will lead to a specific health outcome (such as cancer). Nor are scientists able to define what constitutes a "safe" level of EMF exposure.

However, while science has not yet answered all of our questions, it has determined one fact very clearly—all electromagnetic radiation impacts living beings. As I will discuss, science demonstrates a

wide range of bioeffects linked to EMF exposure. For instance, numerous studies have found that EMF damages and causes mutations in DNA—the genetic material that defines us as individuals and collectively as a species. Mutations in DNA are believed to be the initiating steps in the development of cancers, and it is the association of cancers with exposure to EMF that has led to calls for revising safety standards. This type of DNA damage is seen at levels of EMF exposure equivalent to those resulting from typical cell phone use.

The damage to DNA caused by EMF exposure is believed to be one of the mechanisms by which EMF exposure leads to negative health effects. Multiple separate studies indicate significantly increased risk (up to two and three times normal risk) of developing certain types of brain tumors following EMF exposure from cell phones over a period of many years. One review that averaged the data across 16 studies found that the risk of developing a tumor on the same side of the head as the cell phone is used is elevated 240% for those who regularly use cell phones for 10 years or more. An Israeli study found that people who use cell phones at least 22 hours a month are 50% more likely to develop cancers of the salivary gland (and there has been a four-fold increase in the incidence of these types of tumors in Israel between 1970 and 2006). And individuals who lived within 400 meters of a cell phone transmission tower for 10 years or more were found to have a rate of cancer three times higher than those living at a greater distance. Indeed, the World Health Organization (WHO) designated EMF—including power frequencies and radio frequencies—as a possible cause of cancer.

While cancer is one of the primary classes of negative health effects studied by researchers, EMF exposure has been shown to increase risk for many other types of negative health outcomes. In fact, levels of EMF thousands of times lower than current safety standards have been shown to significantly increase risk for neurodegenerative diseases (such as Alzheimer's and Lou Gehrig's disease) and male infertility associated with damaged sperm cells. In one study, those who lived within 50 meters of a high voltage power line were significantly more likely to develop Alzheimer's disease when compared to those living 600 meters or more away. The increased risk was 24% after one year, 50% after 5 years, and 100% after 10 years. Other research demonstrates that using a cell phone between two and four hours a day leads to 40% lower sperm counts than found in men who do not use cell phones, and the surviving sperm cells demonstrate lower levels of motility and viability.

EMF exposure (as with many environmental pollutants) not only affects people, but all of nature. In fact, negative effects have been demonstrated across a wide variety of plant and animal life. EMF, even at very low levels, can interrupt the ability of birds and bees to navigate. Numerous studies link this effect with the phenomena of avian tower fatalities (in which birds die from collisions with power line and communications towers). These same navigational effects have been linked to colony collapse disorder (CCD), which is devastating the global population of honey bees (in one study, placement of a single active cell phone in front of a hive led to the rapid and complete demise of the entire colony). And a mystery illness affecting trees around Europe has been linked to Wi-Fi radiation in the environment.

There is a lot of science—highquality, peer-reviewed science—demonstrating these and other very troubling outcomes from exposure to electromagnetic radiation. These effects are seen at levels of EMF that, according to regulatory agencies like the Federal Communications Commission (FCC), which regulates cell phone EMF emissions in the United States, are completely safe.

I have worked at Columbia University since the 1960s, but I was not always focused on electromagnetic fields. My PhDs in physical chemistry from Columbia University and colloid science from the University of Cambridge provided me with a strong, interdisciplinary academic background in biology, chemistry, and physics. Much of my early career was spent investigating the properties of surfaces and very thin films, such as those found in a soap bubble, which then led me to explore the biological membranes that encase living cells.

I studied the biochemistry of infant respiratory distress syndrome (IRDS), which causes the lungs of newborns to collapse (also called hyaline membrane disease). Through this research, I found that the substance on the surface of healthy lungs could form a network that prevented collapse in healthy babies (the absence of which causes the problem for IRDS sufferers).

A food company subsequently hired me to study how the same surface support mechanism could be used to prevent the collapse of the air bubbles added to their ice cream. As ice cream is sold by volume and not by weight, this enabled the company to reduce the actual amount of ice cream sold in each package. (My children gave me a lot of grief about that job, but they enjoyed the ice cream samples I brought home.)

I also performed research exploring how electrical forces interact with the proteins and other components found in nerve and muscle membranes. In 1987, I was studying the effects of electric fields on membranes when I read a paper by Dr. Reba Goodman demonstrating some unusual effects of EMF on living cells. She had found that even relatively weak power fields from common sources (such as those found near power lines and electrical appliances) could alter the ability of living cells to make proteins. I had long understood the importance of electrical forces on the function of cells, but this paper indicated that magnetic forces (which are a key aspect of electromagnetic fields) also had significant impact on living cells.

Like most of my colleagues, I did not think this was possible. By way of background, there are some types of EMF that everyone had long acknowledged are harmful to humans. For example, X-rays and ultraviolet radiation are both recognized carcinogens. But these are ionizing forms of radiation. Dr. Goodman, however, had shown that even non-ionizing radiation, which has much less energy than X-rays, was affecting a very basic property of cells—the ability to stimulate protein synthesis.

Because non-ionizing forms of EMF have so much less energy than ionizing radiation, it had long been believed that non-ionizing electromagnetic fields were harmless to humans and other biological systems. And while it was acknowledged that a high enough exposure to non-ionizing EMF could cause a rise in body temperature—and that this temperature increase could cause cell damage and lead to health problems—it was thought that low levels of non-ionizing EMF that did not cause this rise in temperature were benign.

In over 20 years of experience at some of the world's top academic institutions, this is what I'd been taught and this is what I'd been teaching. In fact, my department at Columbia University (like every other comparable department at other universities around the world) taught an entire course in human physiology without even mentioning magnetic fields, except when they were used diagnostically to

detect the effects of the electric currents in the heart or brain. Sure magnets and magnetic fields can affect pieces of metal and other magnets, but magnetic fields were assumed to be inert, or essentially powerless, when it came to human physiology.

As you can imagine, I found the research in Dr. Goodman's paper intriguing. When it turned out that she was a colleague of mine at Columbia, with an office just around the block, I decided to follow up with her, face-to-face. It didn't take me long to realize that her data and arguments were very convincing. So convincing, in fact, that I not only changed my opinion on the potential health effects of magnetism, but I also began a long collaboration with her that has been highly productive and personally rewarding.

During our years of research collaboration, Dr. Goodman and I published many of our results in respected scientific journals. Our research was focused on the cellular level—how EMF permeate the surfaces of cells and affect cells and DNA—and we demonstrated several observable, repeatable health effects from EMF on living cells. As with all findings published in such journals, our data and conclusions were peer reviewed. In other words, our findings were reviewed prior to publication to ensure that our techniques and conclusions, which were based on our measurements, were appropriate. Our results were subsequently confirmed by other scientists, working in other laboratories around the world, independent from our own.

Over the roughly 25 years Dr. Goodman and I have been studying the EMF issue, our work has been referenced by numerous scientists, activists, and experts in support of public health initiatives including the BioInitiative Report, which was cited by the European Parliament when it called for stronger EMF regulations. Of course, our work was criticized in some circles, as well. This was to be expected, and we welcomed it—discussion and criticism is how science advances. But in the late 1990s, the criticism assumed a different character, both angrier and more derisive than past critiques.

On one occasion, I presented our findings at a US Department of Energy annual review of research on EMF. As soon as I finished my talk, a well-known Ivy League professor said (without any substantiation) that the data I presented were "impossible." He was followed by another respected academic, who stated (again without any substantiation) that I had most likely made some "dreadful error." Not only were these men wrong, but they delivered their comments with an intense and obvious hostility.

I later discovered that both men were paid consultants of the power industry—one of the largest generators of EMF. To me, this explained the source of their strong and unsubstantiated assertions about our research. I was witnessing firsthand the impact of private, profit-driven industrial efforts to confuse and obfuscate the science of EMF bioeffects.

I knew that this was not the first time industry opposed scientific research that threatened their business models. I'd seen it before many times with tobacco, asbestos, pesticides, hydraulic fracturing (or "fracking"), and other industries that paid scientists to generate "science" that would support their claims of product safety.

That, of course, is not the course of sound science. Science involves generating and testing hypotheses. One draws conclusions from the available, observable evidence that results from rigorous and

reproducible experimentation. Science is not sculpting evidence to support your existing beliefs. That's propaganda. As Dr. Henry Lai (who, along with Dr. Narendra Singh, performed the groundbreaking research demonstrating DNA damage from EMF exposure) explains, "a lot of the studies that are done right now are done purely as PR tools for the industry."

http://www.salon.com/2014/04/12/your_cellphone_is_killing_you_what_people_dont_want_you_to_know_about_electromagnetic_fields/

Report of Partial Findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd:

The purpose of this communication is to report partial findings from a series of radiofrequency radiation (RFR) cancer studies in rats performed under the auspices of the U.S. National Toxicology Program (NTP).1

This report contains peer-reviewed, neoplastic and hyperplastic findings only in the brain and heart of Hsd:Sprague Dawley® SD® (HSD) rats exposed to RFR starting in utero and continuing throughout their lifetimes. These studies found low incidences of malignant gliomas in the brain and schwannomas in the heart of male rats exposed to RFR of the two types [Code Division Multiple Access (CDMA) and Global System for Mobile Communications (GSM)] currently used in U.S. wireless networks. Potentially preneoplastic lesions were also observed in the brain and heart of male rats exposed to RFR. The review of partial study data in this report has been prompted by several factors. Given the widespread global usage of mobile communications among users of all ages, even a very small increase in the incidence of disease resulting from exposure to RFR could have broad implications for public health. There is a high level of public and media interest regarding the safety of cell phone RFR and the specific results of these NTP studies.

Lastly, the tumors in the brain and heart observed at low incidence in male rats exposed to GSM- and CDMA-modulated cell phone RFR in this study are of a type similar to tumors observed I some epidemiology studies of cell phone use. These findings appear to support the International Agency for Research on Cancer (IARC) conclusions regarding the possible carcinogenic potential of RFR.

http://biorxiv.org/content/biorxiv/early/2016/05/26/055699.full.pdf

Dangers of living near cell phone towers raised

When Mom asked me to look into possible health hazards posed by cell phone panel antennas that a church in her neighborhood wants to put up, I expected to find reassuring facts to allay Mom's concerns. Instead, I found deeply disturbing data that makes me wonder why the public is not being informed about health risks—and why our government seems intent on covering up troubling truths.

Cell phone companies and the U.S. Food and Drug Administration assert that cell phone towers don't pose health risks to the public. Some studies support this assertion, but other studies suggest just the opposite.

Harvard-trained Dr. Andrew Weil at the University of Arizona's medical center recently observed, "In January 2008, the National Research Council (NRC), an arm of the National Academy of Sciences and the National Academy of Engineering, issued a report saying that we simply don't know enough about the potential health risks of long-term exposure to RF energy from cell phones themselves, cell towers, television towers, and other components of our communications system. The scientists who prepared the report emphasized, in particular, the unknown risks to the health of children, pregnant women, and fetuses as well as of workers whose jobs entail high exposure to RF (radiofrequency) energy….Because so much of cell phone technology is new and evolving, we don't have data on the consequences of 10, 20 or 30 years worth of exposure to the RF energy they emit," Weil concluded. The report called for long-term safety studies on all wireless devices including cell phones, computers, and cell phone towers.

A 2006 report issued by the World Health Organization (WHO) offered some reassurance and found no scientific evidence that radiofrequency signals from cell towers cause adverse health effects. The report noted that up to five times more of the RF signals from FM radio and television (than from cell towers) are absorbed by the body with no known adverse effects on health in the more than 50 years that radio and TV broadcast stations have been operating.

But an Australian study found that children living near TV and FM broadcast towers, which emit similar radiation to cell towers, developed leukemia at three times the rate of children living over seven miles away.

If you live within a quarter mile of a cell phone antenna or tower, you may be at risk of serious harm to your health, according to a German study cited at www.EMF-Health.com, a site devoted to exposing hazards associated with electromagnetic frequencies from cell phone towers and other sources.

Cancer rates more than tripled among people living within 400 meters of cell phone towers or antennas, a German study found. Those within 100 meters were exposed to radiation at 100 times normal levels. An Israeli study found risk of cancer quadrupled among people living within 350 meters (1,148 feet) of a cell phone transmitter—and seven out of eight cancer victims were women. Both studies focused only on people who had lived at the same address for many years.

Other studies have found that levels of radiation emitted from cell phone towers can damage cell tissues and DNA, causing miscarriage, suppressing immune function, and causing other health problems.

Astoundingly, the federal government does not allow rejection of a cell phone tower based on health risks, according to a 2005 article. A Google search found no evidence that this situation has changed.

Yet over 1.9 million cell phone towers and antennae have been approved nationwide without federal studies to assure safety of those living nearby.

How many cell phone towers and antennas are in your neighborhood? Find out at www.antennasearch.com. I plugged in my address on Mt. Helix, hardly an urban stronghold, and was astounded to discover that there are 96 cell phone towers, 286 antennas and 2 proposals for new towers within four miles of my home!

So how about Mom's neighborhood, where an Evangelical church insists a new tower is needed? Mom gets perfectly fine cell phone reception, and so do the neighbors she's spoken with—not surprising since there are already 113 towers and 335 antennas within a four-mile radius.

Churches, schools, fire stations, and other buildings are increasingly erecting cell phone towers or antennas because cell phone companies are willing to pay rental fees of hundreds or even thousands of dollars a month—welcome infusions for cash-strapped budgets. But at what cost to the public's health? There are young children in Mom's neighborhood, less than one block from the proposed cell phone antenna site.

In Sweden, the government requires interventions to protect the public from electromagnetic frequencies. Why isn't the U.S. government paying attention to this potential risk to public safety?

http://www.eastcountymagazine.org/cell_phone_towers_238

Scientific Evidence Shows That Americans' Brains Are Being Fried By Cell Towers

JUNE 23, 2016

New evidence indicates that cell phones are damaging more than just our social lives. Indeed, cell towers may actually be altering the function of your brain by inhibiting your thought process, decreasing your appetite and your ability to sleep and causing irritability. A study recently published by the *British Medical Journal* and led by professor Enrique A. Navarro concluded that the severity of these types of symptoms was directly correlated with cell tower exposure. The closer a person lives to a cell tower, the more pronounced the symptoms will be – regardless of the demographic.

Cell towers rely on electromagnetic switching signals in order to broadcast and receive data. The human body, most especially the brain, also uses electromagnetic impulses to send and transmit messages along different pathways. This is essential for normal function across the body system. Scientists have long suspected that being subject to even low levels of EMF pollution, or electropollution, could have ill effects on the brain and body. This new study supports past suspicions and adds to the current body of proof that cell towers can be harmful.

Electromagnetic hypersensitivity is an increasingly frequent phenomenon that is being dismissed by many doctors and scientists as a made-up condition.

A 2010 meta-analysis found that 80 percent of the reviewed studies indicated that cell phone tower proximity correlated with a higher prevalence of adverse symptoms and cancer, yet many conventional doctors and industry-fed scientists refuse to admit that these effects are real. What is most shocking is that these symptoms have all been reported by people living near towers that currently meet the required safety guidelines. Navarro suggests that this means our current guidelines on cell phone tower safety are not sufficient enough to protect the public. People who live less than 500 meters from a cell phone tower are at an exceptionally high risk, due to the nature of electromagnetic fields. Electropollution severity is calculated by the inverse square of distance. This means that someone who lives twice as close to the cell tower will be subject to four times the amount of radiation. Living within 21 miles of a cell tower means you are exposed to a reasonably significant level of electropollution.

There are presently 190,000 cell towers within the U.S., and that number is continuing to grow. It is suspected that at least people are affected by cell phone towers, if not more.

http://www.emf.news/2016-06-23-scientific-evidence-shows-that-americans-brains-are-being-fried-by-cell-towers.html

Research Findings Presented at International Conference Link Cell Phone Microwave Radiation to Cancer, Low Birth Weight and Sperm Damage

Experts call for strong policy action to protect the public and especially children who are more vulnerable.

Teton Village, WY -- (SBWIRE) -- 02/22/2017 -- Scientists from 10 nations evaluated the latest peer reviewed body of evidence linking adverse health effects to wireless radiation at an expert forum that was held in late January at Hebrew University. The scientists call for policy actions to reduce exposure were recommended, such as legislation that significantly and more protectively reduces human exposure to RF, minimization of wireless in schools and public places, and national campaigns about screen time and children's health.

The event was organized in cooperation with the U.S. National Institute of Environmental Health Sciences (NIEHS) and Environmental Health Trust (EHT). Findings included the large $25 million study by the US National Toxicology Program, and other investigations confirming cancer-promoting effects, along with substantially increased cancer risks to regular long-term cell phone users, and important new studies indicating potential human health risks of 5G communication systems, wireless in schools, and the physical and psychological effects of screen time

According to Dr. Anthony Miller— long-term advisor at the World Health Organization's IARC, and advisor to Environmental Health Trust detailed the current epidemiological research on long-term cell phone users stated that his overall conclusions are that in terms of the 2011 IARC classification, today, radiofrequency fields should be considered probable causes of human cancer. Lecture videos are now available at the Environmental Health Trust conference website.

Evidence of Increased Malignancies and DNA Damage

Dr. Linda Birnbaum, Director of the US National Institute of Environmental Health Sciences, prepared a presentation shared by Dr. Ron Melnick on the National Toxicology Program (NTP) study's research findings on rats exposed to wireless radiation at levels mimicking long- term cell phone exposures. Findings include: increased highly malignant cancers of the brain; increased highly malignant cancer of the heart nerve sheath; and DNA damage in the brain. In addition to increased malignancies and DNA damage, lower litter weights were found in the wireless exposed rats of the NTP study.

"We feel obliged to call for strong actions of precaution by international regulators, above all for children and pregnant women," stated Dr. Fiorella Belpoggi, Director of the Research Department of the Cesare Maltoni Cancer Research Centre Ramazzini Institute.

At conference the Dr. Fiorella Belpoggi of the Italian Ramazzini Institute released new partial findings of their cell phone radiation studies, which found, like the NTP study, lower birth weight in rats prenatally exposed to cell phone radiation. The Ramazzini study radiation exposures were orders of magnitude lower density of Radiofrequency (RF) fields than the NTP study exposures and were set to mimic cell tower radiation exposure levels.

The meeting was co-chaired by Devra Davis, PhD, MPH, visiting Professor of Medicine of The Hebrew University, who provided an update on research findings that link wireless radiation to brain, liver and

skin damage in prenatally exposed animals, and Professor Emeritus of Medicine, physician-researcher Charles Greenblatt, an acclaimed basic researcher and discoverer of ancient DNA.

Videos of Lectures and Presentation Slides are available at the Conference website:
http://ehtrust.org/science/key-scientific-lectures/2017-expert-forum-wireless-radiation-human-health

http://www.sbwire.com/press-releases/research-findings-presented-at-international-conference-link-cell-phone-microwave-radiation-to-cancer-low-birth-weight-and-sperm-damage-774481.htm

How this sign put Berkeley in the center of the cellphone safety debate

City of Berkeley becomes the first to require cellphone retailers to display warnings about radiation

Updated: 10:41 AM PDT Apr 10, 2017

"Berkeley is the first city in the country to get stores to post warnings. It's a small step, but it's an important step," said Joel Moskowitz, PhD, director of UC Berkeley's Center for Family and Community Health at the University's School of Public Health.

In 2009, Moskowitz turned his focus from scientific research on the health effects of tobacco to cellphones after a visiting scholar from the National Cancer Center in South Korea exposed him to scientific literature looking at whether mobile phone use increased the risk of tumors.

"The cellphone manufacturers want you to keep a minimum distance away from your body and you should find out what that distance is," Moskowitz said. "If you keep the device by your body you will exceed the safety limits provided by the FCC."

That message is what Berkeley officials say is the purpose behind the city's "Right to Know" ordinance: To educate the public that information on radiation exposure from mobile devices can be found in phone, tablet and laptop manuals.

"We're just saying let's take the information that's buried in your cellphone and buried in the manual, and put it where someone might have a chance to read it," said Berkeley councilman Kriss Worthington, who co-sponsored the ordinance with former councilman Max Anderson.

The city council voted unanimously to pass the ordinance in May 2015.

That law now has the city in the middle of a federal lawsuit brought by the CTIA, The Wireless Association.

The CTIA is a Washington, D.C.-based trade group that represents the cellphone industry and is fighting in court to stop retailers from displaying the warnings.

A spokesman for the CTIA said the signs violate their First Amendment rights by compelling them to say something they don't agree with.

"It sort of still surprises me that it could become the subject of a federal lawsuit and have so much money spent against it," Worthington said. "We're not trying to tell the cellphone companies to say something horrible about themselves. And the information isn't even horrible, it's basically saying be prudent, be careful."

Radiation from a phone is measured through something called the Specific Absorption Rate (SAR). It measures how fast a given amount of energy is absorbed by the human body, and it's measured in watts per kilogram.

Since 1996, the FCC has required that all cellphones sold in the U.S. not exceed an SAR limit of 1.6 watts per kilogram over 1 gram of tissue.

Mobile devices are tested and must meet the applicable limits for radio frequency exposure at a certain distance from the body.

Senior Research Fellow and cellphone safety advocate Lloyd Morgan says most people don't know radiation warnings exist in a series of sub-menus in their mobile devices.

"There's a 'stay-away distance,' my vocabulary, for a cellphone. You can't keep it closer than 'X' without exceeding the exposure limit," Morgan said. "Good luck finding where that is in a phone."

For example, in an Apple iPhone, you follow these steps to find the information:
Settings > General > About > Legal > RF Exposure

The iPhone 7's instructions say, "Carry iPhone at least 5mm away from your body to ensure exposure levels remain at or below the as-tested levels." The iPhone 5 instructions suggest at least 10mm.

Apple iPads say: "Orient the device in portrait mode with the home button at the bottom of the display, or in landscape mode with the cellular antenna away from your body or other objects."

Apple iPads also warn "a small percentage of people may be susceptible to blackouts or seizures."

"You're being exposed throughout the day as long as the device is on, so you want to keep it away from your body, especially when you're making a call," Moskowitz said. "There's a variety of simple things you can do to reduce your exposure."

The CTIA continues to challenge the City of Berkeley's disclosure ordinance. It refused a phone interview, but issued the following statement:

"We are challenging the City of Berkeley's disclosure ordinance because it violates the First Amendment and contradicts binding court decisions. In fact, the Federal appeals court in California previously invalidated a very similar cellphone ordinance in San Francisco. The scientific evidence refutes Berkeley's ill-informed and misleading mandatory warnings about cellphones, according to the FCC and other experts. For example, as the Food and Drug Administration states on its website, '[t]he weight of scientific evidence has not linked cellphones with any health problems.' With these realities on our side, we are confident that we will prevail."

Berkeley officials say the city wasn't taking a stance on the science.

"There will be continuing research, and we all will be learning more as things go along. In the meantime, I think it's prudent to stop and think and not to be alarmist, but just be careful," Worthington said.

But Moskowitz and Morgan, who say they have been closely following the scientific research on cellphones and health, compare the battle for public awareness about RF radiation to the history of tobacco.

"The cellphone industry is using the same playbook that the tobacco industry used successfully for decades. They've war-gamed the science," Moskowitz said.

Moskowitz has focused much of his career studying Big Tobacco, the tobacco control movement and the public health impacts of tobacco.

"Some scientists tried to argue that cigarette smoke was good for you, citing health professionals saying cigarettes were good for you," Moskowitz said. "And cellphone industries have some research, and it's pretty poor research, that suggests that cellphone radiation may be good for you."

"There's a long tradition of industries being able to delay a major public health problem from common knowledge for decades," Morgan said. "It took 50 years to get tobacco, to get asbestos. Hopefully, this will be faster."

Moskowitz has been fighting a legal battle of his own, trying to bring cellphone safety information to the public.

In 2016, he sued the California Department of Public Health.

It started with an insider tip urging Moskowitz to do some digging for a document on cellphones and health prepared by health professionals with the CDPH.

"In early 2014, I submitted a public records request for this document, which had originally been prepared, I later found out, in 2010," Moskowitz said.

The document is currently marked 'Not for Public Release.'

"It's really a fact sheet about cellphone radiation, which summarizes the research briefly and provides a set of recommendations to the public," Moskowitz said.

The document gives an overview of EMFs, the electromagnetic radiation emitted by some consumer electronics like cellphones. It acknowledges studies that show a link between EMFs and brain cancer and EMFs and fertility problems.

It provides tips on how to lower your risk of over-exposure by keeping a distance between you and your phone or tablet, much like the guidelines that exist within cellphone manuals.

It also says children and teens may be more sensitive to EMF exposure.

"They do not want to admit there is any kind of problem," said Lloyd Morgan.

Morgan closely studies the ongoing scientific research into how EMFs affect the human body.

Learning the CDPH document exists, but was kept in the dark, infuriates him.

"You can't just place a phone against your head. Or against your body," Morgan said. "They know there's a problem. And eventually, the public will know."

The Department of Public Health denied all the public records requests Moskowitz filed starting in 2014.

According to Moskowitz, officials told him they wouldn't release the document because the Centers for Disease Control and Prevention issued similar guidelines on their website.

"I felt the document belongs in the hands of the public. I couldn't understand, and in fact the informants couldn't explain, why the document was suppressed," Moskowitz said.

Moskowitz decided to file suit.

"This is a very serious issue," Moskowitz said. "I thought it would be in the public interest to see if I can make this document see the light of day."

The case was filed in the Sacramento County Superior Court, assigned to Judge Shelleyanne Chang.

In its opposition briefs, the CDPH asserted the "public's health may be harmed" if the document is released and that it will "needlessly confuse and possibly alarm cellphone users."

It goes on to speculate the document might even cause people to flood doctors' offices concerned about their devices.

"The final explanation which came out during the lawsuit was, well, this wouldn't be in the public interest to put this information out there because the cellphone industry is part of the public and they would not be happy to see this information reaching the public," Moskowitz said, citing page 15 of the opposition brief.

In March, the department released the watermarked draft version of the Cellphones and Health guidelines to the San Francisco Chronicle.

The Sacramento Superior Court judge ruled in Moskowitz's favor.

"She saw no reason why the department should not release the document to me. She also ruled in her final ruling that the state could not mark up the document," Moskowitz said.

The California Department of Public Health refused an interview with KCRA.

A spokesman said via e-mail:

"The document has not been released before because it was the subject of pending litigation. We've now had the hearing and received the court's final ruling on the hearing, but the formal order has not yet been issued. We will comply with that order when it is issued, and if it requires us to release all versions of the drafts, we will do so, but attached is one of the drafts from 2015. Please note the draft notation on the document is original as it existed in 2015.

Please also note the information contained in this document by the California Department of Public Health's (CDPH) Division of Environmental and Occupational Disease Control is not original research. CDPH employees examined then-existing scientific research on the potential health effects of cellphone use. The Department also reviewed existing guidance documents (e.g., international, national, state and local public health agencies) at that time and prepared a draft of guidance based on that review. However, the guidance was never finalized or adopted by the Department. The project was discontinued when the Centers for Disease Control and Prevention (CDC) issued national guidance on the same subject."

"Most of the reasons turn out to be quite bogus when you really inspect them," Moskowitz said.

The public will soon have access to the CDPH document.

In her final ruling on March 13, Judge Shelleyanne Chang ruled that the CDPH must now release the cellphone guidelines without a watermark.

Moskowitz is still waiting.

"I've been studying this issue for eight years now and I believe the risk could be quite profound from a health and public health standpoint," Moskowitz said.

http://www.kcra.com/article/how-this-sign-put-berkeley-in-the-center-of-the-cellphone-safety-debate/9171064

iPhone 6 Bendgate: Apple's Instructions Say Not To Keep Your Phone In Your Pocket Anyway

As the Internet lights up with images of the iPhone 6 plus emerging from people's pockets bent like a used paperclip, it may be useful to consider this: Apple explicitly tells you not to carry your phone in your pocket, due to the radiation exposure threat it poses.

In the little handbook that comes with every iPhone (the one that gets discarded almost immediately because, it's a cell phone, we all know what to do with those, right?) Apple also explicitly states that the phone is not supposed to touch your body much, if at all.

In fact, in the manual for the iPhone 5, Apple says users should carry their iPhones a full 10 millimeters (or .39 inches) away from their bodies at all times. That means, if the device is in the pocket of your jeans, it's much too close.

Previous manuals were more explicit. The iPhone 3G safety manual warns that radiation exposure may exceed government standards during "body-worn operation" if the phone is "positioned less than 15 millimeters (5/8 inch) from the body (e.g., when carrying iPhone in your pocket)." The iPhone, Apple says, should always be worn in a belt clip or holster.

Cell phone radiation, measured in radio-frequency exposure, is regulated in the U.S. by the Federal Communications Commission (FCC). All phones must be tested to ensure that they emit a specific absorption rate of not more than 1.6 watts of radio-frequency energy per kilogram of body tissue, a rule designed to prevent harm from the heat generated by radio-frequency waves.

But while cell phones are tested against a simulated human head in the "talking" position, they are not tested against the body (or in a pocket) in the "carrying" position. Instead, the tests assume the user is carrying the phone in a holster, away from the body, whenever the phone is broadcasting at full power. And since radio-frequency energy exposure increases sharply the closer the phone gets to your body, some worry that FCC testing is missing a lot of actual exposure.

In addition, the FCC tests do not consider biological effects caused by anything other than the heat generated from radio-frequency energy, like altered protein expression or DNA damage. Experts and organizations like the Environmental Working Group have expressed concern over the testing rules for cell phones, citing studies that show links between cancers and cell phone radiation exposure. In 2011, a World Health Organization report classified radiation from cell phones as "possibly carcinogenic to humans," particularly as cell phone use relates to an increased risk for glioma, a malignant type of brain cancer.

Then there are the gaps in cell phone radiation testing. The American Academy of Pediatrics, for example, recently urged the FCC to begin taking child users of cellphones into account. "Children are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation," their letter to the FCC reads.

Yet the science is inconclusive. The National Cancer Institute points to several studies that have been unable to establish a relationship between cell phone use and cancer.

The FCC is currently conducting an ongoing reassessment of its policies.

"The U.S. has among the most conservative standards in the world. As part of our routine review of these standards, which we began last year, we will solicit input from multiple stakeholder experts,

including federal health agencies and others, to guide our assessment," a spokesman for the FCC tells *Newsweek*.

Radiation from cell phones is not an Apple-only problem, of course. Blackberry's user manual advises .59 inches of separation between the body and the phone. Earlier manuals pushed for nearly a full inch (.98 inch) of separation, and told users to "use hands-free operation if it is available and keep the BlackBerry device at least 0.98 inch (25 millimeters) from your body (including the lower abdomen of pregnant women and teenagers)."

A manual for an earlier Blackberry model—the 8830 World Edition—includes a warning against carrying the phone directly on the body: "Carrying solutions, including RIM-approved carrying solutions and carrying solutions not approved by RIM, that do not come equipped with an integrated belt clip SHOULD NOT be worn or carried on the body."

It adds that users should not try to use the phone where there is not a good signal, because radiation output grows higher and higher as the phone struggles to connect with a tower. Neither Apple nor Blackberry responded to a request for comment at the time of publishing.

Dr. David Carpenter, the director of the Institute for Health and the Environment University at Albany, New York has spent several years reading research on radio-frequency exposure and has testified to Congress on the subject. He says he is very wary of cell phones.

"My personal sense is that the evidence for increases in cancer is quite strong. It's not one hundred percent, but most studies have shown that [people with] high exposures have elevations in leukemia, brain cancers [and] some other kinds of cancers."

He predicts that cancer rates will go up in the coming decades.

"Latency for brain cancer is 20 to 30 years. Cell phones haven't been around for all that long. I think it's likely that we'll see an increase in cases over the next years," Carpenter says.

http://www.newsweek.com/iphone-6-bendgate-apple-says-your-iphone-shouldnt-go-your-pocket-avoid-273313

Mobile phones are 'cooking' men's sperm

Study finds sperm levels of men who kept their phones in their pocket during the day were quite seriously affected in 47 per cent of cases

Fertility experts are warning man that using a mobile for as little as an hour a day is "cooking sperm" and lowering level significantly.

The new study shows that having a mobile phone close to the testicles - or within a foot or two of the body - can lower sperm levels so much that conceiving could be difficult.

The findings have led to a leading British fertility expert to advise men to stop being addicted to mobile phones.

The study - by highly respected specialists - found that sperm levels of men who kept their phones in their pocket during the day were seriously affected in 47 per cent of cases compare to just 11 per cent in the general population.

Professor Martha Dirnfeld, of the Technion University in Haifa, said: "We analysed the amount of active swimming sperm and the quality and found that it had been reduced.

"We think this is being caused by a heating of the sperm from the phone and by electromagnetic activity."

The team monitored more than 100 men attending a fertility clinic for a year.

They found that besides men keeping their phones close to their groin many spoke on the phone while it was charging and kept it only a few centimetres from their bed.

Even keeping the phone on a bedside table appears to raise lower sperm cell counts

The findings are in the journal Reproductive BioMedicine and support a long-feared link between dropping fertility rates in men and the prevalent use of cellular phones.

The quality of sperm among men in Western countries is constantly decreasing and is considered crucial in 40 percent of the cases in which couples have difficulty conceiving a child.

http://www.telegraph.co.uk/news/health/news/12167957/Mobile-phones-are-cooking-mens-sperm.html

The Hidden Health Effects of Cell Towers

Cell towers blanket the globe. The United States is home to more than 300,000 cell sites. They appear innocent. But are they?

Cell towers are the base stations that control mobile phone communication. They may or may not be clearly visible in your neighborhood. Sometimes they are disguised as cacti, trees, or even flags.

Because we can't see, feel or smell the electromagnetic radiation coming from a cell tower (or cell site which includes towers, antenna masts and other base station forms), it's hard to believe there is any potential for harm.

In fact, the Federal Communications Commission, our government's regulating agency, has made sure health concerns aren't addressed when cell tower applications are considered. According to the Telecommunications Act of 1996,

"No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

(Localities are permitted to reject a cell tower if the tower is deemed unsightly, which is one reason for the disguises.)

The wireless industry has relied on this legal favoritism, banking on consumer trust in government oversight. After all, wouldn't we know if cell towers (or cell phones) are unsafe?

The FCC already agrees that cell tower workers may be injured by these fields because of the proximity. While the FCC position is solely based on thermal effects of non-ionizing radiation, it is clear the agency agrees that cell tower workers may be at risk of adverse health effects (emphasis mine):

Studies have shown that environmental levels of RF energy routinely encountered by the general public are far below levels necessary to produce significant heating and increased body temperature (References 32, 37, 45, 46, 48 and 54). However, there may be situations, particularly workplace environments near high-powered RF sources, where recommended limits for safe exposure of human beings to RF energy could be exceeded. In such cases, restrictive measures or actions may be necessary to ensure the safe use of RF energy.

How well is the FCC monitoring these levels? Sen. Richard Blumenthal of Connecticut and Rep. Anna Eshoo of California believe the FCC has dropped the ball when it comes to monitoring and regulating the safety of cell towers, especially when it comes to cell site workers. The lawmakers issued a challenge to the FCC on September 17, 2015,

Excessive exposure to RF radiation leads to well-documented potential harms, especially to workers who spend time near the antenna and in the line of the antenna's beam. At sufficient power levels and exposure durations, RF radiation has the ability to heat biological tissue. Thermal effects can include eye damage, sterility, and cognitive impairments.

We urge the FCC and the Occupational Safety and Health Administration (OSHA) to work together to enforce exposure limits and ensure wireless carriers are taking the required precautions to protect the safety of all persons who may be exposed to dangerous levels of RF radiation near wireless towers.

If the FCC agrees that cell tower workers are at risk, and two members of Congress are concerned enough to issue a reprimand, what does this say about the overall safety of cell sites?

The World Health Organization officially classifies electromagnetic radiation a possible 2B carcinogen. (The same category as lead, DDT, and styrene.)

The following studies suggest short-term and long-term health risks within 300-400 meters of a cell tower. (Less than three-tenths of a mile)

- Santini Study

This is a compelling survey of 270 men and 260 women showing changes in symptoms in relation to cell tower proximity. Note the decrease in reported headaches the further from the cell site.

Table I. Percentages of complaints reported compared to responses of a level of « 0 », by persons living in the vicinity of base stations as a function of their distance away from a base station.

Symptoms	Distances from base stations in meters (m)											
	< 10 m		10 to 50 m		50 to 100 m		100 to 200 m		200 to 300 m		> 300 m ...	
	2	3	2	3	2	3	2	3	2	3	2	3
Fatigue	76 *	72 *	63.5*	50.9*	60.6	56.6*	64.2	41.1	66.6*	43.7	40.7	27.2
Irritability	32.8	23.2*	41.7*	25.7*	47.2*	44.1*	25.8	4.1	25	9	18	3.3
Headaches	51 *	47.8*	40 *	26.1*	40.6*	36.7*	60.7*	31.2*	19.3	0	15.6	1.8
Nausea	14.5*	6.9	8.4	3	5.7	3.8	2.4	4,6	0	2.3	2,1	1.1
Loss of Appetite	20.4*	8.3	8	5.5	5	5	6.9	0	4.2	0	3.3	3.3
Sleep Disruption	41.3*	57.1*	41.4*	57.5*	46.9*	58.5*	45.8*	50*	33.3	35.5	13.8	21.1
Depression	16,9	26.8*	21.6	19.7*	11.6	24 *	16.2	3.1	13.6	2.5	10.3	3.7
Feeling of Discomfort	28 *	45.4*	25.2*	18.9	30.6*	12.8	15.7*	0	9.7	5.1	2.4	8.1
Difficulty in concentration	39.3	28.8*	37.5	16.6	34.2	26.4*	25	12.5	43.3	5.5	26.7	7.1
Memory Loss	27.8	25.4*	29.4	26.6*	37.1*	29 *	25	15.6	17.2	11.1	17.9	5.8
Skin Problems	18.1*	17.1*	6.6	10.8	11.1*	11.1	13.9*	7.5	8.7	0	1.2	4.6
Visual Disruptions	14.5	24.3*	23	13.5	22	7.1	2.5	4.9	15	2.8	13.6	4.1
Hearing Disruptions	33.3*	17.4	17.7*	12	8.3	15.5	7.7	7.7	11.6	9.5	5.6	8.7
Dizziness	10	12.5*	17.3*	7,5*	9.6	9.6*	12.2	2.7	7.7	5.2	6.2	0
Movement Difficulties	5.6	7.7*	8.2	1.7	3	3	0	0	2	0	2.9	1
Cardio-vascular Problems	10.1*	13 *	15.3*	9.6	12.3*	7.4	8.7	0	8.5	6.5	1	3

* Significant difference ($p < 0.05$) in comparison to reference subjects found at > 300 m or not exposed, for the responses 2 – « often » and 3 – « very often».

- Kempton West Study (2007)

Researchers measured blood levels of serotonin and melatonin in 25 participants before and after the activation of a new cell site. There were unfavorable changes in almost all participants.

- Naila Study (2004)

Researchers discovered a threefold increase in cancers after five years exposure to microwave radiation from a nearby mobile phone mast transmitter compared to those patients living further away.

- France Questionnaire (2003)

Researchers in France found significant health effects on people living within 300 meters of mobile phone base stations. Fatigue, sleep disturbance, headaches, concentration problems, depression, memory problems, irritability, cardiovascular problems, hearing disruption, skin problems, dizziness, etc.

(For a comprehensive list of studies linking cell towers to adverse health effects, see Electromagnetic Health.)

As noted above current FCC regulations are based on thermal effects. Thanks to the BioIniative Report 2012 we now have a compilation of more than 1800 studies showing biological effects from non-ionizing radiation.

In May 2016, the U.S. government released preliminary findings for a $25 million rat study linking cell phone radiation to cancer. See NTP Study: Cell Phones and Cancer.

What does this say about schools, homes or offices located in a cell tower vicinity?

I recently measured the radiofrequency fields near a cell tower 5 miles from our home. The tower hovers over an Ace Hardware store and equipment rental company. Several housing developments are nearby.

I recorded the following video over a period of four minutes. I watched for unusual spikes.

https://youtu.be/AhiO38PB8q0

The level went as high as 1827 mw**/**m^2**. The BioIniative Report recommends an upper threshold of 0.03** mw**/**m^2. Our home has an RF level of .0005 mw/m^2. (Our RF levels went down after we transitioned away from Wi-Fi. See From Wireless to Wired – Our Family's Journey.)

http://it-takes-time.com/2015/09/22/health-effects-of-cell-towers/

The Hidden Dangers of Cell Phone Radiation

Every day, we're swimming in a sea of electromagnetic radiation (EMR) produced by electrical appliances, power lines, wiring in buildings, and a slew of other technologies that are part of modern life. From the dishwasher and microwave oven in the kitchen and the clock radio next to your bed, to the cellular phone you hold to your ear—sometimes for hours each day—exposure to EMR is growing and becoming a serious health threat.

But there's a huge public health crisis looming from one particular threat: EMR from cellular phones—both the radiation from the handsets and from the tower-based antennas carrying the signals—which studies have linked to development of brain tumors, genetic damage, and other exposure-related conditions.1-9 Yet the government and a well-funded cell phone industry media machine continue to mislead the unwary public about the dangers of a product used by billions of people. Most recently, a Danish epidemiological study announced to great fanfare the inaccurate conclusion that cell phone use is completely safe.10

George Carlo, PhD, JD, is an epidemiologist and medical scientist who, from 1993 to 1999, headed the first telecommunications industry-backed studies into the dangers of cell phone use. That program remains the largest in the history of the issue. But he ran afoul of the very industry that hired him when his work revealed preventable health hazards associated with cell phone use.

In this article, we look at why cell phones are dangerous; Dr. Carlo's years-long battle to bring the truth about cell phone dangers to the public; the industry's campaign to discredit him and other scientists in the field; and what you can do to protect yourself now.
The cellular phone industry was born in the early 1980s, when communications technology that had been developed for the Department of Defense was put into commerce by companies focusing on profits. This group, with big ideas but limited resources, pressured government regulatory agencies—particularly the Food and Drug Administration (FDA)—to allow cell phones to be sold without pre-market testing. The rationale, known as the "low power exclusion," distinguished cell phones from dangerous microwave ovens based on the amount of power used to push the microwaves. At that time, the only health effect seen from microwaves involved high power strong enough to heat human tissue. The pressure worked, and cell phones were exempted from any type of regulatory oversight, an exemption that continues today. An eager public grabbed up the cell phones, but according to Dr. George Carlo, "Those phones were slowly prompting a host of health problems."

Today there are more than two billion cell phone users being exposed every day to the dangers of electromagnetic radiation (EMR)—dangers government regulators and the cell phone industry refuse to admit exist. Included are: genetic damage, brain dysfunction, brain tumors, and other conditions such as sleep disorders and headaches.1-9 The amount of time spent on the phone is irrelevant, according to Dr. Carlo, as the danger mechanism is triggered within seconds. Researchers say if there is a safe level of exposure to EMR, it's so low that we can't detect it.

The cell phone industry is fully aware of the dangers. In fact, enough scientific evidence exists that some companies' service contracts prohibit suing the cell phone manufacturer or service provider, or joining a class action lawsuit. Still, the public is largely ignorant of the dangers, while the media regularly

trumpets new studies showing cell phones are completely safe to use. Yet, Dr. Carlo points out, "None of those studies can prove safety, no matter how well they're conducted or who's conducting them." What's going on here? While the answer in itself is simplistic, how we got to this point is complex.

In December, 2006, an epidemiological study on cell phone dangers published in the Journal of the National Cancer Institute sent the media into a frenzy.10 Newspaper headlines blared: "Danish Study Shows Cell Phone Use is Safe," while TV newscasters proclaimed, "Go ahead and talk all you want—it's safe!" The news seemed to be a holiday gift for cell phone users. But unfortunately, it's a flawed study, funded by the cell phone industry and designed to bring a positive result. The industry's public relations machine is working in overdrive to assure that the study get top-billing in the media worldwide.

According to Dr. George Carlo, the study, by its design, could not identify even a very large risk. Therefore, any claim that it proves there's no risk from cell phones is a blatant misrepresentation of the data that will give consumers a very dangerous false sense of security.

"Epidemiological studies are targets for fixing the outcome because they're observational in nature instead of experimental," Dr. Carlo explains. "It's possible to design studies with pre-determined outcomesthat still fall within the range of acceptable science. Thus, even highly flawed epidemiological studies can be published in peer-reviewed journals because they're judged against a pragmatic set of standards that assume the highest integrity among the investigators."

Key problems with the study are:

There are few discernable differences between who was defined as cell phone users and who wasn't. Thus, people defined as exposed to radiation were pretty much the same as those defined as not exposed to radiation. With few differences, it's nearly impossible to find a risk.

Users were defined as anyone who made at least one phone call per week for six months between 1982 and 1995. So any person who made 26 calls was a cell phone user and therefore considered exposed to radiation. Those with less than 26 calls were non-users. In reality, the radiation exposure between users and non-users defined in this manner is not discernable.

The "exposed" people used ancient cell phone technology bearing little resemblance to cell phones used today. The results, even if reliable, have no relevance to the 2 billion cell phone users today.

From 1982 to 1995, cell phone minutes cost much more than today and people used their phones much less. Thus there was very little radiation exposure.

During the study's time frame, people likely to use their cell phones the most were commercial subscribers. Yet this highest exposed group, in whom risk would most easily be identified, was specifically excluded from the study.

There were no biological hypotheses tested in the study. It was therefore only a numbers game. Ignored were mechanisms of disease found in other studies of cell phone radiation effects, including genetic damage, blood-brain barrier leakage, and disrupted intercellular communication. The study did not discuss any research supporting the notion that cell phones could cause problems in users.

The study itself was inconsistent with cancer statistics published worldwide addressing the Danish population. This study showed a low risk of cancer overall, when in fact Denmark has some of the highest cancer rates in the world. This inconsistency suggested that something in the data does not add up.

The cell phone industry constantly guards its financial interests, but unfortunately, an unwitting public can be harmed in the process, says Dr. Carlo. "Industry-funded studies in many cases now produce industry-desired outcomes. By tampering with the integrity of scientists, scientific systems and public information steps over the lines of propriety that are appropriate for protecting business interests—especially when the casualty of the interference is public health and safety."

In 1993, the cell phone industry was pressured by Congress to invest $28 million into studying cell phone safety. The cause of this sudden concern was massive publicity about a lawsuit filed by Florida businessman David Reynard against cell phone manufacturer NEC. Reynard's wife, Susan, died of a brain tumor, and he blamed cell phones for her death. Reynard revealed the suit to the public on the Larry King Live show, complete with dramatic x-rays showing the tumor close to where Susan held her cell phone to her head for hours each day.

The next day, telecommunications stocks took a big hit on Wall Street and the media had a field day. The industry trade association at the time, the Telecommunications Industry Association (TIA), went into crisis mode, claiming thousands of studies proved cell phones were safe and what Reynard and his attorney said was bunk. TIA reassured the public that the government had approved cell phones, so that meant they were safe. The media demanded to see the studies, but, says Dr. Carlo, "The industry had lied. The only studies in existence then were on microwave ovens. At that time, 15 million people were using cell phones, a product that had never been tested for safety."

- *Originally developed for the Department of Defense, cell phones devices were never tested for safety. They entered the marketplace due to a regulatory loophole.*
- *Questions about cell phone safety arose in the early 1990s, when a businessman filed a lawsuit alleging that cell phones caused his wife's death due to brain cancer.*
- *To address the questions surrounding cell phone safety, the cell phone industry set up a non-profit organization, Wireless Technology Research (WTR). Dr. George Carlo was appointed to head WTR's research efforts.*
- *Under Dr. Carlo's direction, scientists found that cell phone radiation caused DNA damage, impaired DNA repair, and interfered with cardiac pacemakers.*
- *European research confirmed Dr. Carlo's findings. Studies suggest that cell phone radiation contributes to brain dysfunction, tumors, and potentially to conditions such as autism, attention deficit disorder, neurodegenerative disease, and behavioral and psychological problems.*
- *Dr. Carlo brought safety information about cell phones to the public through his book, Cell Phones: Invisible Hazards in the Wireless Age, and by creating the Safe Wireless Initiative and the Mobile Telephone Health Concerns Registry.*

Forced to take action, the cell phone industry set up a non-profit organization, Wireless Technology Research (WTR), to perform the study. Dr. Carlo developed the program outline and was asked to head the research. Oversight of the issue was charged to the FDA, though it could have and probably should have gone to the Environmental Protection Agency (EPA), which fought hard for jurisdiction. But the industry had enough influence in Washington to get whatever overseer it wanted. It simply didn't want to tangle with EPA because, says Dr. Carlo, "… the EPA is tough."

"Anything that's ever made a difference in terms of public health has come from the EPA," he says. "But safety issues that are covered in corruption and questions seem to always have a connection to the FDA, which has been manipulated by pharmaceutical companies since it was born."

When called to help with the cell phone issue, Dr. Carlo was working with the FDA on silicone breast implant research. The choice of Dr. Carlo to head WTR seemed unusual to industry observers. An epidemiologist whose expertise was in public health and how epidemic diseases affect the population, he appeared to lack any experience in researching the effects of EMR on human biology. Based on this, a premature conclusion was drawn by many: Dr. Carlo was an "expert" handpicked by the cell phone industry, and therefore his conclusions would only back up the industry's claim that cell phones are safe.

Dr. Carlo, however, refused to be an easy target. He quickly recruited a group of prominent scientists to work with him, bulletproof experts owning long lists of credentials and reputations that would negate any perception that the research was predestined to be a sham. He also created a Peer Review Board chaired by Harvard University School of Public Health's Dr. John Graham, something that made FDA officials more comfortable since, at the time, the agency was making negative headlines due to the breast implant controversy. In total, more than 200 doctors and scientists were involved in the project.

Once all involved agreed on what was to be done, Dr. Carlo presented the study's stakeholders in the industry, the government, and the public with a strict list of criteria for moving forward.

"The money had to be independent of the industry—they had to put the money in trust and couldn't control who got the funds," he says. "Second, everything had to be peer reviewed before it went public, so if we did find problems after peer review, we could use that information publicly to recommend interventions."

A third requirement was for the FDA to create a formal interagency working group to oversee the work and provide input. The purpose of this was to alleviate any perception that the industry was paying for a result, not for the research itself. But the fourth and last requirement was considered by Dr. Carlo to be highly critical: "Everything needed to be done in sunlight. The media had to have access to everything we did."

The program began, but Dr. Carlo soon discovered that everyone involved had underlying motives."The industry wanted an insurance policy and to have the government come out and say everything was fine. The FDA, which looked bad because it didn't require pre-market testing, could be seen as taking steps to remedy that. By ordering the study, law makers appeared to be doing something. Everyone had a chance to wear a white hat."

Dr. Carlo and his team developed new exposure systems that could mimic head-only exposure to EMR in people, as those were the only systems that could approximate what really happened with cell phone exposure. Those exposure systems were then used for both in vitro (laboratory) and in vivo (animal) studies. The in vitro studies used human blood and lymph tissue in test tubes and petri dishes that were exposed to EMR. These studies identified the micronuclei in human blood, for example, associated with cell phone near-field radiation. The in vivo studies used head only exposure systems and laboratory rats. These studies identified DNA damage and other genetic markers.

Says Dr. Carlo: "We also conducted four different epidemiological studies on groups of people who used cell phones, and we did clinical intervention studies. For example, studies of people with implanted cardiac pacemakers were instrumental in our making recommendations to prevent interference between cell phones and pacemakers. In all, we conducted more than fifty studies that were peer-reviewed and published in a number of medical and scientific journals."

But manipulation by the industry had begun almost immediately at the start of research. While Dr. Carlo and his team had never defined their research as being done to prove the safety of cell phones, the industry internally defined it as an insurance policy to prove that phones were safe. From the outset, what was being said by the cell phone industry in public was different from what was being said by the scientists behind closed doors.

The pacemaker studies were a harbinger of bad things to come. Results showed that cell phones do indeed interfere with pacemakers, but moving the phone away from the pacemaker would correct the problem. Amazingly, the industry was extremely upset with the report, complaining that the researchers went off target. When Dr. Carlo and his colleagues published their findings in the New England Journal of Medicine in 1997,11 the industry promptly cut off funding for the overall program. It took nine months for the FDA and the industry to agree on a scaled-down version of the program to continue going forward. Dr. Carlo had volunteered to step down, since he was clearly not seeing eye-to-eye with the industry, but his contract was extended instead, as no one wanted to look bad from a public relations standpoint.

The research continued, and what it uncovered would be a dire warning to cell phone users and the industry's worst nightmare. When the findings were ready for release in 1998, the scientists were suddenly confronted with another challenge: the industry wanted to take over public dissemination of the information, and it tried everything it could to do so. It was faced with disaster and had a lot to lose.

Fearing the industry would selectively release research results at best, or hold them back at worst, Dr. Carlo and his colleagues took the information public on their own, creating a highly visible war between the scientists and the industry. An ABC News expose on the subject increased the wrath of the industry.

According to Dr. Carlo, "The industry played dirty. It actually hired people to put negative things about me and the other scientists who found problems on the internet, while it tried to distance itself from the program. Auditors were brought in to say we misspent money, but none of that ever held up. They tried every angle possible."

This included discussions with Dr. Carlo's ex-wife to try to figure out ways to put pressure on him, he says. Threats to his career came from all directions, and Dr. Carlo learned from Congressional insiders that the word around Washington was that he was "unstable." But all the character assassination paled in comparison to what happened next.

Toward the end of 1998, Dr. Carlo's house mysteriously burned down. Public records show that authorities determined the cause of the blaze was arson, but the case was never solved. Dr. Carlo refuses to discuss the incident and will only confirm that it happened. By this time, enough was

enough. Dr. Carlo soon went "underground," shunning the public eye and purposely making himself difficult to find.

A cellular phone is basically a radio that sends signals on waves to a base station. The carrier signal generates two types of radiation fields: a near-field plume and a far-field plume. Living organisms, too, generate electromagnetic fields at the cellular, tissue, organ, and organism level; this is called the biofield. Both the near-field and far-field plumes from cell phones and in the environment can wreak havoc with the human biofield, and when the biofield is compromised in any way, says Dr. Carlo, so is metabolism and physiology.

"The near field plume is the one we're most concerned with. This plume that's generated within five or six inches of the center of a cell phone's antenna is determined by the amount of power necessary to carry the signal to the base station," he explains. "The more power there is, the farther the plume radiates the dangerous information-carrying radio waves."

A carrier wave oscillates at 1900 megahertz (MHz) in most phones, which is mostly invisible to our biological tissue and doesn't do damage. The information-carrying secondary wave necessary to interpret voice or data is the problem, says Dr. Carlo. That wave cycles in a hertz (Hz) range familiar to the body. Your heart, for example, beats at two cycles per second, or two Hz. Our bodies recognize the information-carrying wave as an "invader," setting in place protective biochemical reactions that alter physiology and cause biological problems that include intracellular free-radical buildup, leakage in the blood-brain barrier, genetic damage, disruption of intercellular communication, and an increase in the risk of tumors. The health dangers of recognizing the signal, therefore, aren't from direct damage, but rather are due to the biochemical responses in the cell.

Here's what happens:

- Cellular energy is now used for protection rather than metabolism. Cell membranes harden, keeping nutrients out and waste products in.
- Waste accumulating inside the cells creates a higher concentration of free radicals, leading to both disruption of DNA repair (micronuclei) and cellular dysfunction.
- Unwanted cell death occurs, releasing the micronuclei from the disrupted DNA repair into the fluid between cells (interstitial fluid), where they are free to replicate and proliferate. This, says Dr. Carlo, is the most likely mechanism that contributes to cancer.
- Damage occurs to proteins on the cell membrane, resulting in disruption of intercellular communication. When cells can't communicate with each other, the result is impaired tissue, organ, and organism function. In the blood-brain barrier, for example, cells can't keep dangerous chemicals from reaching the brain tissue, which results in damage.

With the background levels of information-carrying radio waves dramatically increasing because of the widespread use of cell phones,Wi-Fi, and other wireless communication, the effects from the near and far-fields are very similar. Overall, says Dr. Carlo, almost all of the acute and chronic symptoms seen in electrosensitive patients can be explained in some part by disrupted intercellular communication. These symptoms of electrosensitivity include inability to sleep, general malaise, and headaches. Could this explain the increase in recent years of conditions such as attention-deficit hyperactivity disorder (ADHD), autism, and anxiety disorder?

"One thing all these conditions have in common is a disruption, to varying degrees, of intercellular communication. When we were growing up, TV antennas were on top of our houses and such waves were up in the sky. Cell phones and Wi-Fi have brought those things down to the street, integrated them into the environment, and that's absolutely new. The recognition mechanism, where protein vibration sensors on the cell membrane pick up a signal and interpret it as an invader, only works because the body recognizes something it's never seen before."

As to increases in brain tumors tied to cell phone use, it's too early to tell due to a lack of hard data, says Dr. Carlo. "We're never going to see that in time to have it matter. Here in the US, we're six years behind in getting the brain tumor database completed, and currently the best data are from 1999. By the time you see any data showing an increase, the ticking time bomb is set."

Epidemic curve projections, however, indicate that in 2006, we can expect to see 40,000 to 50,000 cases of brain and eye cancer. This is based on published peer-reviewed studies that allow calculation of risk and construction of epidemic curves. By 2010, says Dr. Carlo, expect that number to be between 400,000 and 500,000 new cases worldwide.

"This means we're on the beginning curve of an epidemic, with epidemic defined as a change in the occurrence of a disease that is so dramatic in its increase that it portends serious public health consequences," says Dr. Carlo. "This is what's not being told to the public. One of the things that I suggest to people who use a cell phone is to use an air tube headset. If you use a wired headset, the current moving through the wire of the headset attracts ambient informational carrying radio waves and thereby increases your exposure."

The industry took its tricks elsewhere—to Europe, which had picked up the ball and began funding independent research to corroborate or confirm the work of Dr. Carlo and his team. The work was completed in mid-2004 and when it was released,12 it not only provided independent scientific corroboration of the work done by Dr. Carlo's group, but also took the work a step further and showed how the problems were occurring mechanistically. This information formed a biologically plausible hypothesis for how cell phone radiation could be related to so many diseases.

Dr. Carlo noted, "The industry exerted pressure on the scientists who conducted the work, including renowned German scientist Dr. Franz Adlkofer. It first tried to change the conclusions of the work, then to delay its public release. Then Dr. Adlkofer, the lead scientist, was attacked in the media and threatened privately with no more research money, a ruined reputation—similar to what we experienced in the WTR. But this situation attracted the attention of a German documentary filmmaker, who decided to do a film on the cell phone issue."

It was enough to bring Dr. Carlo into view again, as he was asked to participate. The film, The Boiling Frog Principle, by Klaus Scheidsteger, builds on information from his first film, The Cell Phone War, and will be released in 2007. Its intent is to integrate the latest political and scientific evidence from around the world, and bring forth to consumers important information on cell phone dangers that was previously withheld.

Currently in the US, there are seven class action lawsuits moving forward against the cell phone industry, says Dr. Carlo, and nine other cases that are personal injury cases brought by people with brain cancer. In the past two years, two workers compensation awards were given to people with

brain tumors based on a link between their tumors and their cell phone use in the workplace. Both of these cases occurred in California.

"What we have now is a major litigation burden, a vulnerability the cell phone industry has never before been under," Dr. Carlo says. "They're uninsured for these health risk claims and are already positioning themselves for a congressional bailout, like the Savings and Loan crisis of the late 1980s. They'll lose a couple of these lawsuits and once they do, there'll be an onslaught of new litigation against them."

The country can't afford for the cell phone industry to go under, Dr. Carlo says, as it would have a disastrous impact on the entire economy—some estimates say over 30% of investment stocks in retirement funds are tied to telecommunications shares. That's why Congress will figure out a way to bail out the industry.

"The industry thinks they can afford to continue on with this institutional arrogance, endangering millions of men, women and children because, at the end of the day, they believe they'll not be held accountable. They think they can continue to manipulate consumers."

It's been nearly 12 years since the WTR was funded. Despite Dr. Carlo's revealing research and the corroborating research of other scientists from around the world that continue to follow, a search of media reports today on the subject of cell phone dangers tends to suggest one of only two conclusions: There is no risk, or no one has yet proven the risk. That's at odds with more than 300 studies in the peer-reviewed scientific literature supporting an increased risk of disease. Clearly, something doesn't add up.

The industry's manipulation of the media to consider only one study at a time obfuscates the big picture.Individually, there's little to see. But the depth and breadth of the science that points to the problem, and the compilation of studies, make the future look frightening. Like the September 11 tragedy, where no one in government talked to each other and did not see it coming for lack of a big picture view, the health crisis from cell phone use looms darkly.

"When you put all the science together, we come to the irrefutable conclusion that there's a major health crisis coming, probably already underway," warns Dr. Carlo. "Not just cancer, but also learning disabilities, attention deficit disorder, autism, Alzheimer's, Parkinson's, and psychological and behavioral problems—all mediated by the same mechanism. That's why we're so worried. Time is running out. When you put the pieces of the puzzle together, it's such a wide ranging problem. It's unlike anything we've ever seen before."

http://www.lifeextension.com/Magazine/2007/8/report_cellphone_radiation/

Children Are Endangered by Cell Phone Radiation!

Mobile phone firms cynically target children even though they may be most vulnerable to the effects of radiation, a leading scientist, Sir William Stewart warned. Stewart chaired the world's largest investigation into mobile phone safety. The $100 billion a year mobile phone industry asserts that there is no conclusive evidence of harmful effects as a result of electromagnetic radiation.

US scientists tested mobile phone-style radiation on more than 10,000 chicken embryos. Pregnant women have been warned to be wary of using mobile phones after it was found radiation produced by the devices caused defects in the chicken embryos. The cell phone industry continues to down-play the risk and defer to more research.

Children using mobile phones absorb as much as double the amount of radiation through their heads as adults. Dr. Om Ghandi, a leading scientist and professor of electrical engineering at the University of Utah found that young children under 10 years of age could absorb radiation across their entire brain. He found that more radiation is able to go past the ear and into the head since a child's ear is thinner and the telephone is closer to the head. All it takes is two millimeters difference," Dr. Ghandi said.

Until proven otherwise and technology becomes safe, children including teens should not use mobile phones, at all, because they are more at risk from the radiation, and their cell growth and brain wave activity are not yet stable. There is conclusive evidence that the phones have biological effects on humans even where the radio frequency or microwave radiation is emitted at very low levels.

Mobile phones and the new wireless technology could cause a "whole generation" of today's teenagers to go senile in the prime of their lives, research suggests. Proffessor Leif Salford, who headed the research at Sweden's prestigious Lund University, says "the voluntary exposure of the brain to microwaves from hand-held mobile phones" is "the largest human biological experiment ever".

Professor Salford and his team have spent 15 years investigating microwave radiation. Their studies proved radiation could open the blood-brain barrier, allowing a protein called albumin to pass into the brain. Their latest work shows the process is linked to serious brain damage. Professor Salford said neurons that would normally not become "senile" until people reached their 60s may now do so when they were in their 30s. In addition, research indicates that exposure to cell phones' radiation causes red blood cells to leak hemoglobin. Scientists exposed samples of blood to microwave radiation and found that even at lower levels than those emitted by cell phones, the blood cells leaked hemoglobin.

Marketing to Children

Cell phones, which are practically standard equipment for teenagers in today's world, are finding their way into the even smaller hands of preteens. Cell phones designed for preteens have controls that allow parents to limit whom kids can talk to. Preteen cell phones are soon to be marketed nationwide with big expectations that preteen cell phone usage will become a national trend. Paul Saffo of the Institute for the Future in Menlo Park, California says, "It won't be long before no self-respecting kindergartner is going to start school without a cell phone."

The cell-phone industry has continually insisted there is no proven link between cell phones and health problems. But patents for protective devices to reduce the amount of radiation absorbed by the brain suggest that Nokia, Ericsson and Motorola believe otherwise. The big three have come up against multimillion-dollar legal actions by people claiming their health has been damaged.

The $100 billion a year mobile phone industry asserts that there is no conclusive evidence of harmful effects as a result of electromagnetic radiation. The Cellular Telecommunications & Internet Association hired Dr. George Carlo to head up a $28 million research program into possible health effects from cellular phones. The research showed an increased rate of brain cancer deaths, development of tumors, and genetic damage among heavy cell phone users. Dr. Carlo has since broken with the cell phone industry to become a vocal critic, and coauthored a book called Cell Phones: Invisible Hazards in the Wireless Age

Radiofrequency electromagnetic radiation researcher at the University of Washington in Seattle, Dr. Henry Lai showed microwave radiation from mobiles caused genetic damage similar to that found in Alzheimer's and Parkinson's sufferers. To quote Dr. Lai, “It is difficult to deny that RFR at low intensity can affect the nervous system.”

Dr. Lai submitted his research to the Stewart committee showing that radiofrequency electromagnetic radiation (RFR) can penetrate into organic tissues and be absorbed and converted into heat. The microwave oven is a familiar use of RFR.

Another scientist, Dr. Hyland, who is based in the physics department at Warwick University and at the International Institute of Biophysics in Neuss-Holzheim, Germany says that the body is an electro-chemical instrument with exquisite sensitivity and the kind of radiation emitted from mobile phones has an impact on the stability of cells in the body.

Children are particularly vulnerable

Referring to the effect of microwaves from a mobile phone, Dr. Hyland says, "The main effects are neurological, causing headaches, lack of concentration, memory loss and sleeping disorders. It can also cause epilepsy in children. Children are particularly vulnerable because they are still developing their immune systems and are less robust than adults.

Dr. Hyland's research, published in the the respected medical publication, The Lancet, follows his analysis of more than 100 earlier studies involving tens of thousands of people.

Radio waves from mobile phones harm body cells and damage DNA

A study that was conducted by 12 research groups in seven European countries found that in laboratory conditions radio waves from mobile phones harm body cells and damage DNA. The research project, called Reflex study, which took four years and which was coordinated by the German research group Verum, studied the effect of radiation on human and animal cells in a laboratory.

After being exposed to electromagnetic fields that are typical for mobile phones, the cells showed a significant increase in single and double-strand DNA breaks, with damage not always being repaired by the cell. Mutated cells are seen as a possible cause of cancer. DNA carries the genetic material of an organism and its different cells. "There was remaining damage for future generation of cells", said project leader Dr. Franz Adlkofer.

In addition, the Swedish Institute of Environmental Medicine found that ten or more years of mobile phone use almost doubles the risk of acoustic neuroma, or benign tumors on the auditory nerve. "When the side of the head on which the phone was usually held was taken into consideration, we found that the risk of acoustic neuroma was almost four times higher on the same side as the phone was held, and virtually normal on the other side," the institute added. While non-cancerous, acoustic neuroma tumors

that are not removed can grow to sizes where they put pressure on the brain and become life threatening.

Cell phone shields

Dr. Neil Cherry, associate professor in environmental health at Lincoln University, Christchurch, stated " Mobile phone manufacturers should take seriously a Swedish finding that their products are dangerous for teenagers and work on developing safer phones". According to Dr. Cherry numerous patents exist for devices or methods to make phones safer but are not being used by manufacturers.

Dr. Cherry estimates that it is practical to reduce users' exposure by 100 to 1000 times. "The primary methods are to manufacture the handset within a Faraday cage shield," he said.

Alarming claims have surfaced in a research publication in the U.K. that not only are many hands-free devices useless in protecting wireless phone users from radiation that might cause tumors, these products may actually raise the amount of radiation being directed into the head by three times. The earplugs in the hands-free kit acted as aerials and channeled more radiation into the ear model than standard cell phones did. Using a hands-free kit and making a call with a mobile phone clipped to your belt means the phone will generally be working at a higher power level. Using a mobile phone clipped to your waist results in a hotspot of radiation being pumped into the liver and kidneys.

http://www.internationalparentingassociation.org/BrainDevelopment/cellphones.html

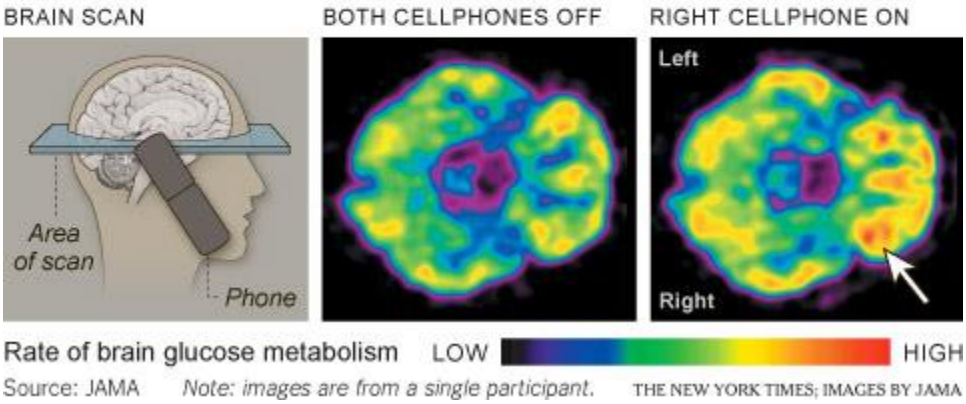
Cellphone Use Tied to Changes in Brain Activity

Researchers from the National Institutes of Health have found that less than an hour of cellphone use can speed up brain activity in the area closest to the phone antenna, raising new questions about the health effects of low levels of radiation emitted from cellphones.

The researchers, led by Dr. Nora D. Volkow, director of the National Institute on Drug Abuse, urged caution in interpreting the findings because it is not known whether the changes, which were seen in brain scans, have any meaningful effect on a person's overall health.

But the study, published Wednesday in The Journal of the American Medical Association, is among the first and largest to document that the weak radio-frequency signals from cellphones have the potential to alter brain activity.

CELLPHONES AND THE BRAIN Researchers tested 47 people by placing a cellphone at each ear. Both phones were off in one test, and in the other test the right phone was on a muted call. After 50 minutes, brain scans showed increased consumption of glucose, or sugar, in areas of the brain near the activated phone.



Source: JAMA *Note: images are from a single participant.* THE NEW YORK TIMES; IMAGES BY JAMA

"The study is important because it documents that the human brain is sensitive to the electromagnetic radiation that is emitted by cellphones," Dr. Volkow said. "It also highlights the importance of doing studies to address the question of whether there are — or are not — long-lasting consequences of repeated stimulation, of getting exposed over five, 10 or 15 years."

Although preliminary, the findings are certain to reignite a debate about the safety of cellphones. A few observational studies have suggested a link between heavy cellphone use and rare brain tumors, but the bulk of the available scientific evidence shows no added risk. Major medical groups have said that cellphones are safe, but some top doctors, including the former director of the University of Pittsburgh Cancer Center and prominent neurosurgeons, have urged the use of headsets as a precaution.

Dr. Volkow said that the latest research is preliminary and does not address questions about cancer or other heath issues, but it does raise new questions about potential areas of research to better understand the health implications of increased brain activity resulting from cellphone use.

"Unfortunately this particular study does not enlighten us in terms of whether this is detrimental or if it could even be beneficial," Dr. Volkow said. "It just tells us that even though these are weak signals, the human brain is activated by them."

Most major medical groups, including the American Cancer Society, the National Cancer Institute and the Food and Drug Administration, have said the existing data on cellphones and health has been reassuring, particularly a major European study released last year by the World Health Organization that found no increased risk of rare brain tumors among cellphone users.

When asked to comment on the latest study, the leading industry trade group, CTIA – The Wireless Association, released a statement emphasizing recent studies that have shown no elevated cancer risk associated with cellphone use.

"The peer-reviewed scientific evidence has overwhelmingly indicated that wireless devices, within the limits established by the F.C.C., do not pose a public health risk or cause any adverse health effects," said John Walls, vice president of public affairs for the trade group, adding that leading global health groups "all have concurred that wireless devices are not a public health risk."

But the new research differed from the large observational studies that have been conducted to study cellphone use. In Dr. Volkow's study, the researchers used brain scans to directly measure how the electromagnetic radiation emitted from cellphones affected brain activity..

The randomized study, conducted in 2009, asked 47 participants to undergo positron emission tomography — or PET — scans, which measure brain glucose metabolism, a marker of brain activity. Each study subject was fitted with a cellphone on each ear and then underwent two 50-minute scans.

During one scan, the cellphones were turned off, but during the other scan, the phone on the right ear was activated to receive a call from a recorded message, although the sound was turned off to avoid auditory stimulation.

Whether the phone was on or off did not affect the overall metabolism of the brain, but the scans did show a 7 percent increase in activity in the part of the brain closest to the antenna when the right phone was turned on. The finding was highly statistically significant, the researchers said. They said the activity was unlikely to be associated with heat from the phone because it occurred near the antenna rather than where the phone touched the head.

In the past, any concerns about the health effects of cellphones have been largely dismissed because the radiofrequency waves emitted from the devices are believed to be benign. Cellphones emit nonionizing radiation, waves of energy that are too weak to break chemical bonds or to set off the DNA damage known to cause cancers. Scientists have said repeatedly that there is no known biological mechanism to explain how nonionizing radiation might lead to cancer or other health problems.

But the new study opens up an entirely new potential area of research. Although an increase in brain glucose metabolism happens during normal brain function, the question is whether repeated artificial stimulation as a result of exposure to electromagnetic radiation might have a detrimental effect.

Although speculative, one theory about how an artificial increase in brain glucose metabolism could be harmful is that it could potentially lead to the creation of molecules called free radicals, which in excess can damage healthy cells. Or it may be that repeated stimulation by electromagnetic radiation could set

off an inflammatory response, which studies suggest is associated with a number of heath problems, including cancer.

Among cancer researchers and others interested in the health effects of cellphones, the study, listed in the medical journal under the heading "Preliminary Communications," was met with enthusiasm because of the credibility of the researchers behind it and the careful methods used.

"It's a high-quality team, well regarded, and if nothing else they're showing that radiation is doing something in the brain," said Louis Slesin, editor of Microwave News, a newsletter on the health effects of electromagnetic radiation. "The dogma in the cellphone community says that it doesn't do anything. What she's shown is that it does do something, and the next thing to find out is what it's doing and whether it's causing harm."

Dr. Ronald B. Herberman, former director of the Pittsburgh Cancer Institute and now chief medical officer for the Intrexon Corporation, a biotechnology company in Germantown, Md., said, "I think it's a very well-designed study, and they have clearly shown that there is biologic activity being induced in the nerve cells in the region where the antenna is the closest." Dr. Herberman said skeptics about the risks of cellphones have focused on the fact that the type of radiation they emit is too weak to break chemical bonds and cannot plausibly be implicated in cancer. However, the new research suggests a potentially different pathway for cancer and other health problems to develop.

"I think it's an important new direction to go in for biologists to start delving deeper into sorting out what might be going on," Dr. Herberman said.

In an editorial accompanying the Journal article, Henry C. Lai, a University of Washington professor of bioengineering who has long raised concerns about cellphone safety, said he hoped the data would broaden the focus of cellphone research and health.

"The bottom line is that it adds to the concern that cellphone use could be a health hazard," said Dr. Lai. "Everybody is worried about brain cancer, and the jury is still out on that question. There are actually quite a lot of studies showing cellphone radiation associated with other events, like sleep disturbances. But people have not been paying a lot of attention to these other types of studies."

https://well.blogs.nytimes.com/2011/02/22/cellphone-use-tied-to-changes-in-brain-activity/

Are wireless phones linked with brain cancer risk?

Swedes who talked on mobile or cordless phones for more than 25 years had triple the risk of a certain kind of brain cancer compared to those who used wireless phones for less than a year, a new study suggests.

The odds of developing glioma, an often deadly brain cancer, rose with years and hours of use, researchers reported in the journal Pathophysiology.

"The risk is three times higher after 25 years of use. We can see this clearly," lead researcher Dr. Lennart Hardell told Reuters Health in a telephone interview.

His finding contrasts with the largest-ever study on the topic - the international Interphone study, which was conducted by the International Agency for Research on Cancer and funded in part by cell phone companies. That study, published in 2010, failed to find strong evidence that mobile phones increased the risk of brain tumors.

Even if the odds of developing a glioma were doubled or tripled, however, the risk would still remain low.

A little more than 5 out of 100,000 Europeans (or 0.005 percent) were diagnosed with any kind of malignant brain tumor between 1995 and 2002, according to a 2012 study in the European Journal of Cancer (bit.ly/1xIlQam). If the rate triples, the odds rise to about 16 out of 100,000 (or 0.016 percent).

Hardell, an oncologist from University Hospital in Orebro, Sweden, and his colleague Michael Carlberg matched 1,380 patients with malignant brain tumors to people without such tumors and compared their wireless phone use.

People who reported using wireless phones for 20 to 25 years were nearly twice as likely to be diagnosed with glioma as those who reported using them for less than a year, the study found. Those who used cell and cordless phones for more than 25 years were three times more likely to develop one of these tumors.

The study did not show an association of wireless phones with malignant brain tumors other than glioma.

Participants who recalled talking the most – more than 1,486 hours – on wireless phones were twice as likely to develop glioma compared to those who said they used the devices the fewest hours – between one and 122 hours, the study found.

Case control studies such as this suffer from a number of limitations, however, the most serious being the need for participants to remember their behavior patterns from decades earlier.

Dr. Gabriel Zada, a neurosurgeon at the University of Southern California's Keck School of Medicine, who wasn't involved in Hardell's study, advises precautionary measures, such as using the phone's speaker or a hands-free headset.

But he told Reuters Health the new study failed to answer his patients' questions about why they developed brain tumors.

"A lot of people ask me, 'Why did I get this brain tumor?'" he said. "There are a lot of different theories. It's a much more convoluted picture than just saying cell phones caused this."

In a 2012 study, Zada reported that rates of malignant tumors in parts of the brain closest to where people hold their phones rose significantly in California from 1992 to 2006 – although the incidence of gliomas throughout the brain decreased (1.usa.gov/1tZffI2).

U.S. cell phone use tripled between 2000 and 2010, according to CTIA - the Wireless Association, which represents manufacturers. But in the U.S. overall, rates of cancer in parts of the brain that would be more highly exposed to radiofrequency radiation from cell phones had not gone up at the time of a 2010 report in the journal Neuro-Oncology (bit.ly/10W3F6z).

Zada believes the current study underscores the need for more research.

"It is more evidence suggesting a possible association between brain tumors and cell phones," he said. "But it's certainly not convincing that cell phones cause brain cancer."

A World Health Organization panel of 31 scientists from 14 countries classified mobile phones as "possibly carcinogenic" in 2011. The U.S. Federal Communications Commission is currently reassessing the safe radiation exposure limits it adopted in 1996.

Cell phones emit radiofrequency energy, which can be absorbed by tissues closest to where the phone is held, the National Cancer Institute says on its website. "Studies thus far have not shown a consistent link between cell phone use and cancers of the brain, nerves, or other tissues of the head or neck," it says.

Hardell is one of the few researchers who include cordless phones when studying cell phones and cancer risk. He believes emissions from the base stations of cordless phones can be problematic, especially when users sleep next to them.

Children may be most vulnerable to wireless phone emissions, Hardell said. They absorb more radiofrequency electromagnetic fields, he writes, because of their small heads, thinner skulls and higher brain conductivity.

"Girls tend to put the smart phone below the pillow," he said. "It's a bad habit to go to bed with your smart phone."

Zada also believes developing brains may be more susceptible and recommends against sleeping with cell phones.

Nevertheless, he said: "It's hard to make formal recommendations because the data is lacking. It's not smoking and lung cancer because it's not proven."

http://www.reuters.com/article/us-brain-cancer-mobilephone-idUSKCN0IV26Y20141111

Has radiation from cell phones and microwaves caused brain tumor cases to double in Denmark?

February 10, 2017

A new report by the Swedish Radiation Protection Foundation, Stralskyddsstiftelsen, has concluded that ever-increasing rates of both brain and central nervous system (CNS) tumors, particularly in Denmark, may be caused by persistent exposure to radiation from mobile phones, microwaves, and other "smart" technology devices that pervade modern society.

Published on January 20, the report shows that such tumors have become increasingly more prevalent since 1990, and especially since 2004 when mobile phones really started to become popular. The data suggests that increasing rates of cancer in the brain, spinal cord cover, CNS spinal cord, and cranial nerves are directly correlated with the increasing use of radioactive devices, including in young people.

Individuals who are more likely to use smart technology devices like Apple iPhones or Wi-Fi enabled tablet devices and laptop computers are much more prone to develop cancer in these areas than those who don't. In fact, such cancers are so prevalent that they are almost on par with rates of melanoma, a type of skin cancer that is much more common.

While there have been claims made by the US National Cancer Institute and the Swedish Radiation Authority that this phenomenon isn't occurring, this just does not align with Stralskyddsstiftelsen's extensive research into the subject over the past several decades, which points to some serious anomalies. It would seem that government authorities are either failing or are refusing to acknowledge the dangers of electromagnetic radiation.

"Case control studies repeatedly show increased risks for CNS tumors from mobile and cordless phone use," the group's latest report emphasizes. "Ever since 2010 all studies investigating risks for brain tumors from mobile phone use over 30 minutes to one hour a day over several years have found increased risks for CNS tumors (glioma, acoustic neuroma and also meningioma)."

"Today 75% of Swedish 16 year old girls use their 'smart phone' over three hours a day and they have been wrongly informed that there are no health risks observed, often with reference to incorrect claims about brain tumor incidence trends."

Thousands of published studies link 'smart' technology use to cancer

Authorities in the US, Sweden, and elsewhere can deny all they want the correlative, and potentially causative, links between the use of smart devices and cancer, but the science speaks for itself. There are hundreds, if not thousands, of published studies and reports that show cancer rates increasing right alongside smart device usage.

For instance, a report by EMFWise Health Effects of Wireless Radiation states that, because microwave radiation can directly penetrate the body, there are serious immune risks associated with the use of these appliances. Some of these risks include alterations of immune cells, changes in lymphocytes, reduced lymphocyte count and hypersensitivity that manifests as autoimmunity.

Non-thermal microwave radiation directly impacts water, it turns out, and the human body is made up of as much as 70 percent water. When interacting with this radiation, the water in the human body is disrupted, which in turn disrupts the complex communications apparatus that exists in the body's cellular network, which uses water to send and receive information.

Similar problems exist for mobile phones, which come into direct contact with the head, hands, and other parts of the body. Electromagnetic pollution ends up interfering with the body wherever the phone is resting, whether via the leg through a pants pocket, the brain as it's pressed against the ear or in the arm as it's held in one's hand.

At this time, industry-funded research on the matter directly conflicts with independent research in most cases. The former presents a cohort of evidence, only 32 percent of which suggests harmful effects, while 70 percent of the latter's research shows harmful effects.

http://newstarget.com/2017-02-10-has-radiation-from-cell-phones-and-microwaves-caused-brain-tumor-cases-to-double-in-denmark.html

Tree damages in the vicinity of mobile phone base stations

Abstract: Since 2005, on the occasion of medical examinations of sick residents living near mobile phone base stations, changes in nearby trees (crown, leaves, trunk, branches, growth) were observed at the same time as clinical symptoms in humans occurred. Both deciduous and coniferous trees as well as shrub species were affected. The assessment of tree diseases is neither impeded by psychological impacts nor by change of location. Impacts of radiofrequency electromagnetic fields (RF-EMF) from radar, radio and TV on plant life have been scientifically demonstrated over the past 80 years. Since 2005, the influence of modulated RF-EMF - that are used in mobile phone telephony - has been investigated in lab experiments. Several research groups reported about the impacts on germination, growth and cell metabolism. Only a few scientific papers have been published to date on research concerning the health conditions of trees in the vicinity of mobile phone base stations. These papers are indicating harmful impacts. For this reason, between 2007 and 2013, the status of trees standing in the neighbourhood of 620 mobile phone base stations was documented. In the radio shadow of buildings or that one of other trees, the trees stayed healthy. However, within the radiation field, damages were observed on exposed trees. Additionally, unilateral crown damage, beginning on the side facing the antenna, strongly indicates a causal relationship with RF-EMF. In the following, examples of crown damages and of premature colouring of leaves are presented. The authors believe, that scientific research is urgently needed to examine these observations.

Conclusion

Observations, that trees are getting damages by radiofrequency electromagnetic fields of mobile phone base stations, accumulate. Often, commonly recognized factors cannot explain the damage patterns. Therefore, the immediate scientific investigation of trees in the radiation field of mobile phone base stations as well as the evaluation of aerial photography is necessary. Synchronously and shortly, exposure tests by using young trees have to be carried out.

In fact this conclusion is well supported by a WHO statement from 1999: that scientific studies on effects of low EMF exposure on animals and plants are urgently needed (MATTHES et al. 2000), a statement which can only be characterized as remarkable.

http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf

Study links bee decline to cell phones

A new study has suggested that cell phone radiation may be contributing to declines in bee populations in some areas of the world.

Bee populations dropped 17 percent in the UK last year, according to the British Bee Association, and nearly 30 percent in the United States says the U.S. Department of Agriculture.

Parasitic mites called varroa, agricultural pesticides and the effects of climate change have all been implicated in what has been dubbed "colony collapse disorder" (CCD).

But researchers in India believe cell phones could also be to blame for some of the losses.

In a study at Panjab University in Chandigarh, northern India, researchers fitted cell phones to a hive and powered them up for two fifteen-minute periods each day.

After three months, they found the bees stopped producing honey, egg production by the queen bee halved, and the size of the hive dramatically reduced.

It's not just the honey that will be lost if populations plummet further. Bees are estimated to pollinate 90 commercial crops worldwide. Their economic value in the UK is estimated to be $290 million per year and around $12 billion in the U.S.

Andrew Goldsworthy, a biologist from the UK's Imperial College, London, has studied the biological effects of electromagnetic fields. He thinks it's possible bees could be affected by cell phone radiation.

The reason, Goldsworthy says, could hinge on a pigment in bees called cryptochrome.

"Animals, including insects, use cryptochrome for navigation," Goldsworthy told CNN.

"They use it to sense the direction of the earth's magnetic field and their ability to do this is compromised by radiation from [cell] phones and their base stations. So basically bees do not find their way back to the hive."

Goldsworthy has written to the UK communications regulator OFCOM suggesting a change of phone frequencies would stop the bees being confused.

"It's possible to modify the signal coming from the [cell] phones and the base station in such a way that it doesn't produce the frequencies that disturb the cryptochrome molecules," Goldsworthy said.

"So they could do this without the signal losing its ability to transmit information."

But the UK's Mobile Operators Association -- which represents the UK's five mobile network operators -- told CNN: "Research scientists have already considered possible factors involved in CCD and have identified the areas for research into the causes of CCD which do not include exposure to radio waves."

Norman Carreck, Scientific director of the International Bee research Association at the UK's University of Sussex says it's still not clear how much radio waves affect bees.

"We know they are sensitive to magnetic fields. What we don't know is what use they actually make of them. And no one has yet demonstrated that honey bees use the earth's magnetic field when navigating," Carreck said.

http://www.cnn.com/2010/WORLD/europe/06/30/bee.decline.mobile.phones/index.html

How Your Cell Phone Is Killing Bees And Starving The Planet

Believe it or not, bees are pretty important. They pollinate the food we eat. And their declining population is a major concern for some scientists.

Now a new study says cell phones are to blame.

A Swiss scientist named Daniel Favre conducted the study, and concluded cell phone signals can cause bees to make extra noise, which is a signal to leave the hive. When cell phones are placed near a hive, it acts as a barrier, keeping bees from returning.

When worker bees abandon the hive, the hive as a whole suffers. Thus, the decline in bee population, and a major scare for food scientists.

http://www.businessinsider.com/cell-phones-are-killing-bees-2011-5

It's Official – Cell Phones are Killing Bees

Scientists may have found the cause of the world's sudden dwindling population of bees – and cell phones may be to blame. Research conducted in Lausanne, Switzerland has shown that the signal from cell phones not only confuses bees, but also may lead to their death. Over 83 experiments have yielded the same results. With virtually most of the population of the United States (and the rest of the world) owning cell phones, the impact has been greatly noticeable.

Led by researcher Daniel Favre, the alarming study found that bees reacted significantly to cell phones that were placed near or in hives in call-making mode. The bees sensed the signals transmitted when the phones rang, and emitted heavy buzzing noise during the calls. The calls act as an instinctive warning to leave the hive, but the frequency confuses the bees, causing them to fly erratically. The study found that the bees' buzzing noise increases ten times when a cell phone is ringing or making a call – aka when signals are being transmitted, but remained normal when not in use.

The signals cause the bees to become lost and disoriented. The impact has already been felt the world over, as the population of bees in the U.S. and the U.K. has decreased by almost half in the last thirty years – which coincides with the popularization and acceptance of cell phones as a personal device. Studies as far back as 2008 have found that bees are repelled by cell phone signals.

Bees are an integral and necessary part of our agricultural and ecological systems, producing honey, and more importantly pollinating our crops. As it is unlikely that the world will learn to forgo the convenience of cell phones, it is unclear how much they will contribute to the decline of bees, and their impact on the environment.

http://inhabitat.com/its-official-cell-phones-are-killing-bees/

Cell phone signals really are killing the bees, study shows

If there's one thing people around the world love to do — in fact, need to do — it's eat. Unfortunately, another thing everyone likes to do is talk on their cell phones. And according to a new study, these two activities are completely at odds because of a cell phone signal's confusing effects on one key player: bees.

Researcher Daniel Favre of the Swiss Federal Institute of Technology has found that wireless signals cause honeybees to become so disoriented that they finally just die. Favre's team conducted 83 separate experiments that tested bees' reactions to a nearby cellphone.

The team found that honeybees made 10 times the amount of noise when a cell phone made or received a call than they did when the phone was in off or standby mode. As Fast Company reports, this noise (generally known as "worker piping") usually signals the bees to leave the hive. But when the reaction is triggered by a cellular signal, the bees just became tragically befuddled.

So, what about a cell phone signal makes bees suicidally crazy? As Favre's report explains: "Worker piping in a bee colony is not frequent, and when it occurs in a colony, that is not in a swarming process, no more than two bees are simultaneously active…The induction of honeybee worker piping by the electromagnetic fields of mobile phones might have dramatic consequences in terms of colony losses due to unexpected swarming."

It's the "dramatic…colony losses" part that everyone should be concerned about. Honeybees are responsible for pollinating about 70 percent of the 100 or so crops on the entire planet that humans use for food.

So-called "colony collapse disorder" among the world's bee population has been recorded since 1972. But it wasn't until 2006 that the drop in the bee population took a nosedive, with beekeepers noting a 30 to 90 percent loss of their bee colonies, up from 17 to 20 percent in previous years.

Favre's study corroborates a 2008 report that showed that honeybees would not return to their hive when a cell phone was placed nearby, which sparked the theory that wireless signals are the problem.

There are other reasons scientists believe the world's crucial bee population is plummeting, things like the use of clothiandin, a pesticide used to treat corn seeds. But Favre's study shows that our cell phone habit is playing a major role in the current bee holocaust. New iPhone, anyone?

http://www.digitaltrends.com/mobile/cell-phones-signals-really-are-killing-the-bees-study-shows/

Report of Possible Impacts of Communication Towers on Wildlife Including Birds and Bees

Executive Summary

India is one of the fastest growing mobile telephony industries in the world. It is estimated that by 2013, 1 billion plus people will be having cell phone connection in India. To support this growth of cell phone subscriber in the country, there has also been a tremendous growth of infrastructure in the form of mobile phone towers. Today, in absence of any policy on infrastructure development and location of cell phone towers, large numbers of mobile phone towers are being installed in a haphazard manner across urban and rural areas including other sparsely populated areas in India. The transmission towers are based on the electromagnetic waves, which over prolonged usage have adverse impacts on humans as well as on other fauna. The adverse effects of electromagnetic radiation from mobile phones and communication towers on health of human beings are well documented today. However, exact correlation between radiation of communication towers and wildlife, are not yet very well established. The Ministry of Environment and Forests usually receives several questions regarding this issue. In view of one such Lok Sabha Starred question regarding 'Ill effects of Mobile Towers on Birds' received on 11th August, 2010, an 'Expert committee to Study the possible Impacts of Communication Towers on Wildlife including Birds and Bees' was constituted on 30th August, 2010 by Ministry of Environment and Forest, Government of India.

Conclusion

The review of existing literature shows that the EMRs are interfering with the biological systems in more ways than one and there had already been some warning bells sounded in the case on bees (Warnke 2007; vanEngelsdorp et al. 2010; Gould 1980; Sharma and Neelima R Kumar 2010) and birds, which probably heralds the seriousness of this issue and indicates the vulnerability of other species as well. Despite a few reassuring reports (Galloni et al. 2005), a vast majority of published literature indicate deleterious effects of EMFs in various species. The window of frequency range and exposure time required to make measurable impacts would vary widely among species and unfortunately we do not have any such data available for most of our free-living floral and faunal species in India. There is an urgent need to focus more scientific attention to this area before it would be too late. Microwave and radiofrequency pollution appears to constitute a potential cause for the decline of animal populations (Balmori 2006; Balmori and Hallberg 2007; Balmori Martínez 2003; Joris and Dirk 2007; Summers-Smith 2003) and deterioration of health of plants and humans living near radiation sources such as phone masts. Studies have indicated the significant non-thermal long-term impacts of EMFs on species, especially at genetic level which can lead to various health complications including brain tumours (glioma), reduction in sperm counts and sperm mobility, congenital deformities, Psychiatric problems (stress, 'ringxity', sleep disorders, memory loss etc.) and endocrine disruptions. However similar aspects are yet to be studied among animal populations. Pollution from EMRs being a relatively new environmental issue, there is a lack of established standard procedures and protocols to study and monitor the EMF impacts especially 22 among wildlife, which often make the comparative evaluations between studies difficult. Moreover, there are no long-term data available on the environmental impacts of EMRs as of now. Well-designed long-term impact assessment studies would be required to monitor the impact of ever-increasing intensities of EMRs on our biological environment. Meanwhile the precautionary principle should prevail and we need to better our standards on EMF to match the best in the world. Studies on impact of Cell phone tower radiation on Birds and wildlife are almost nonexistent from India. There is an urgent need for taking up well designed studies to look into this aspect. Available information from the country on the subject of EMF impacts is restricted to few reports from honey-

bees. However, these studies are not representative of the real life situations or natural levels of EMF exposure. More studies need to be taken up to scientifically establish if any, the link between the observed abnormalities and disorders in bee hives such as Colony Collapse Disorder (CCD).

http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf

Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review

Abstract: This paper summarizes the effect of radio-frequency electromagnetic field (RF-EMF) from cell towers and wireless devices on the biosphere. Based on current available literature, it is justified to conclude that RF-EMF radiation exposure can change neurotransmitter functions, blood-brain barrier, morphology, electrophysiology, cellular metabolism, calcium efflux, and gene and protein expression in certain types of cells even at lower intensities. The biological consequences of such changes remain unclear. Short-term studies on the impacts of RF-EMF on frogs, honey bees, house sparrows, bats, and even humans are scarce and long-term studies are non-existent in India. Identification of the frequency, intensity, and duration of non-ionizing electromagnetic fields causing damage to the biosystem and ecosystem would evolve strategies for mitigation and would enable the proper use of wireless technologies to enjoy its immense benefits, while ensuring one's health and that of the environment.

Conclusion: The Department of Telecommunication (DoT) in India has set new norms for cell phone towers with effect from September 1, 2012 (The Hindu, 2012). Exposure standards for RF-EMF radiation has been reduced to one-tenth of the existing level and SAR from 2 to 1.6 W/kg. This came after the Ministry of Environment and Forests (MOEF) set up an Inter-Ministerial Committee (IMC) to study the effects of RF-EMF radiations on wildlife (Figure 2) and concluded that out of the 919 research papers collected on birds, bees, plants, other animals, and humans, 593 showed impacts, 180 showed no impacts, and 196 were inconclusive studies. They conclude that there are no long-term data available on the environmental impacts of RF-EMF radiations in India. The population of India is increasing as well as the cell phone subscribers and the cell towers as supporting infrastructure. Hence, there is an urgent need to fill the gaps and do further research in this field with emphasis on the effects of early life and prenatal RF-EMF radiation exposure in animals, dosimetry studies, cellular studies using more sensitive methods, and human epidemiological studies, especially on children and young adults on behavioral and neurological disorders and cancer. Meanwhile, one can take the precautionary principle approach and reduce RF-EMF radiation effects of cell phone towers by relocating towers away from densely populated areas, increasing height of towers or changing the direction of the antenna.

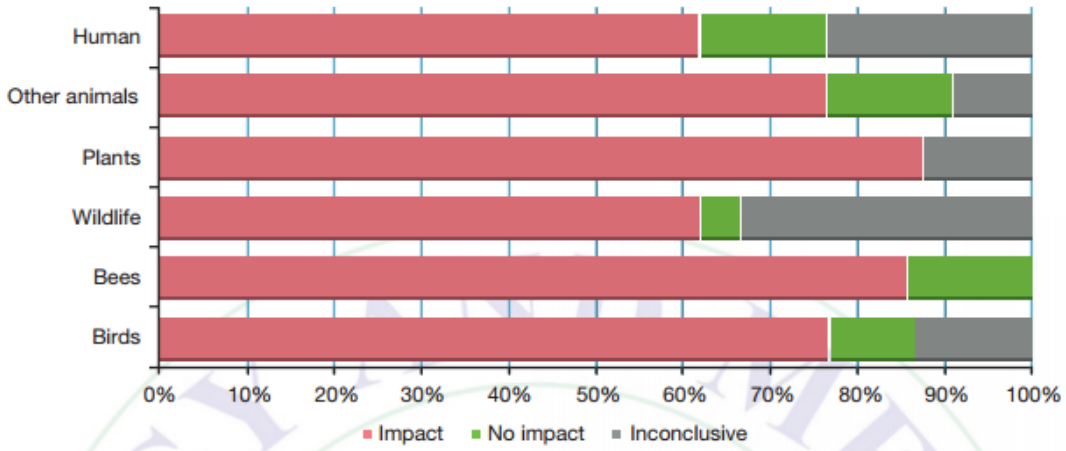


Figure 2: Percentage of studies that reported harmful effect of EMR in various groups of organisms (n = 919), MOEF Report (2010).

http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf

Cell Phones are the Cigarettes of the 21st Century

A comparison of cell phone use, which continues its meteoric rise and cigarette smoking, is illustrative. Just a few of the similarities between the two habits include:

Manufacturers and industry leaders who either hide or debunk unfavorable study results and continue to promote their products despite awareness of the significant dangers to public health

Government conflict of interest created by lobbies for both industries and revenues collected from use taxes

Expensive, effective marketing campaigns aimed at every segment of society, including children

Massive amounts of scientific data proving beyond a shadow of a doubt the direct link between these products and life-threatening damage to the human body

The addictive nature of both products

The primary distinction between cell phone use and cigarettes is that smoking has been around long enough to confirm it can, indeed, be a fatal habit. According to a 2008 World Health Organization (WHO) report, tobacco use kills 5 million people a year worldwide, and is a risk factor in six of the eight leading causes of death.

These are just a few recent examples of study data linking electromagnetic radiation and cell phone use to a stunning array of serious health concerns:

- At a recent Senate Committee hearing, witnesses testified that cell phone use has been linked to salivary gland tumors
- Wearing a cell phone on your hip – either on your belt or in a pocket – has been linked to decreased bone density in the pelvic region. All the other vital organs located in your pelvic region – your liver, kidney, bladder, colon and reproductive organs – are also susceptible to radiation damage.
- Proximity to cell phone towers causes an increase in the symptoms of electromagnetic hypersensitivity, including fatigue, sleep disturbances, visual and auditory disturbances, and cardiovascular effects, just to name a few.

Thanks to a multimillion-dollar research study funded by none other than the Cellular Telephone Industry Association (CTIA), which certainly didn't set out to uncover these results, we now have proof of:

A significant increase in cell phone users' risk of brain tumors at the brain's outer edge, on whichever side the cell phone was held most often.

A 60 percent greater chance of acoustic neuromas, a tumor affecting the nerve that controls hearing, among people who had used cell phones for six years or more.

A higher rate of brain cancer deaths among handheld mobile phone users than among car phone users (car phones are mounted on the dashboard rather than held next to your head)

In addition to this research, a review of 11 long-term epidemiologic studies published in the journal Surgical Neurology revealed that using a cell phone for 10 or more years approximately doubles the risk of being diagnosed with a brain tumor on the same side of the head where the cell phone is typically held.

Australia has seen an increase in pediatric brain cancers of 21 percent in just one decade. This is consistent with studies showing a 40 percent brain tumor increase across the board in Europe and the U.K. over the last 20 years.

Brain cancer has now surpassed leukemia as the number one cancer killer in children.

In addition to the widespread concern about brain cancer, scientists have found that information-carrying radio waves transmitted by cell phones and other wireless devices can:

- Harm your blood cells and cause cellular changes
- Damage your DNA
- Cause nerve-cell damage
- Possibly accelerate and contribute to onset of autism, and trigger Alzheimer's disease (You may have read the recent spin that cellphone use can cure Alzheimer's, but you should know that study involved exposures that were nothing like a cell phone exposure, even though the publicity suggested otherwise. More on this soon.)
- Damage your eyes
- Cause sleep disruptions, fatigue and headaches

http://articles.mercola.com/sites/articles/archive/2010/02/04/cell-phones-are-the-cigarettes-of-the-21st-century.aspx

Pediatricians Warn Cell Phone Radiation Poses Cancer Risk to Children

Following a study last May that linked wireless radiation to deadly heart and brain cancers, the American Academy of Pediatrics (AAP) has issued a series of recommendations that warn parents of the dangers cell phones and other wireless devices present to their children. The initial study was carried out by the US National Toxicology Program over a period of two years. It found that rats suffered DNA damage in their brain cells as well as a high probability of developing brain tumors and malignant Schwann cell tumors in the heart. Dr. Ronald L. Melnick, a toxicologist at the National Institutes of Health, said that the cancer risks for children are even greater due to greater penetration and absorption of cell phone radiation as well as a higher susceptibility to tissue-damaging agents. Dr. Jennifer Lowry, chair of the AAP council on Environmental Health Executive Committee, seconded these claims warning that "[cell phones] are not toys. They have radiation that is emitted from them and the more we can keep it off the body and use [phones] in other ways, it will be safer."

The AAP had previously expressed concern about the dangers of cell phone radiation. 5 years ago, an Egyptian study showed that living in proximity to mobile phone base stations increases the risk for developing various problems such as headaches, memory problems, dizziness, depression, and insomnia. Though this study focused on short-term effects, the AAP had previously warned that it was important to consider the possible cumulative damage from the electromagnetic radiation emitted by cell phones and supported further research. The US National Toxicology Program study only confirmed the AAP's suspicions that cumulative exposure to cell phone radiation has damaging effects on human health, especially children whose bodies are still developing.

Pediatricians also expressed their concern over the legal limits of cell phone radiation established by the Federal Communications Commission (FCC). The FCC's allowable limit is currently 1.6 W/kg, but this standard has not been revised since 1996 despite that fact the cell phone use has increased dramatically and that cell phone technology has grown by leaps and bounds. In addition, the FCC's limit is based on the devices' potential effect on fully-grown adults based on 20-year-old, outdated science. The limit does not consider the effect of cell phone radiation on children even though children's skulls are thinner and more readily absorb radiation. These facts also led the AAP to recommend a government review of cell phone radiation standards that "protect children's health, reflect current cell phone use patterns, and provide meaningful consumer disclosure." However, it appears doubtful that the FCC will make changes anytime soon as cell phone manufacturers are likely to fight against any new regulations that would further reduce the radiation limit.

http://www.trueactivist.com/pediatricians-warn-cell-phone-radiation-poses-cancer-risk-to-children/

EEG Changes Due to Experimentally Induced 3G Mobile Phone Radiation

Abstract

The aim of this study was to investigate whether a 15-minute placement of a 3G dialing mobile phone causes direct changes in EEG activity compared to the placement of a sham phone. Furthermore, it was investigated whether placement of the mobile phone on the ear or the heart would result in different outcomes. Thirty-one healthy females participated. All subjects were measured twice: on one of the two days the mobile phone was attached to the ear, the other day to the chest. In this single-blind, cross-over design, assessments in the sham phone condition were conducted directly preceding and following the mobile phone exposure. During each assessment, EEG activity and radiofrequency radiation were recorded jointly. Delta, theta, alpha, slowbeta, fastbeta, and gamma activity was computed. The association between radiation exposure and the EEG was tested using multilevel random regression analyses with radiation as predictor of main interest. Significant radiation effects were found for the alpha, slowbeta, fastbeta, and gamma bands. When analyzed separately, ear location of the phone was associated with significant results, while chest placement was not. The results support the notion that EEG alterations are associated with mobile phone usage and that the effect is dependent on site of placement. Further studies are required to demonstrate the physiological relevance of these findings.

Introduction

Mobile phone usage has become an integrated part of modern society. In recent years, number and level of usage of mobile phones has increased rapidly. In 2013, 6.8 billion mobile phone subscriptions were registered [1]. In recent years, new technology of 3rd generation (3G) or universal mobile telecommunication system (UMTS), using the 1.9–2.1 GHz frequency band has been introduced, followed by the 4th generation. Although there are some worries [2] about the potential negative effects of RF-EMF on health, large sections of the population are avid customers. The number of studies investigating whether or not RF-EMF has adverse health effects has increased rapidly. The research field is broad since several areas are explored, ranging from carcinogenesis and infertility to basic effects on physiological parameters. In general, results are conflicting and inconclusive [3–6]. While a number of studies demonstrate influence of radiation on health, others cannot replicate these findings. Nevertheless, the International Agency for Research on Cancer concluded that there is “limited evidence in humans” and in 2011 it was decided to classify mobile phone radiation in group 2B—possibly carcinogenic [2]. In contrast, the 2012 overview report of the Mobile Telecommunications and Health Research (MTHR) Programme concluded that there is no evidence of carcinogenic effects due to exposure to mobile phone signals [7]. However, examining possible effects due to long-term exposure and the effects on other outcomes were suggested as priority research areas. Also in the WHO Research Agenda for Radiofrequency Fields of 2011, “provocation studies to identify neurobiological mechanisms underlying possible effects of RF on brain function, including sleep and resting EEG” are considered to have a high priority [8].

The effects of mobile phone radiation on electroencephalography (EEG) have been studied since the mid-nineties [9]. There are a number of studies which have investigated the effects of mobile phone radiation on resting EEG, on sleep EEG, on the performance of cognitive tasks, and on event related potentials (ERP) of conscious sensory stimuli. Apart from a relative consistent finding [9–15] of an increased power in the alpha band, no consistent results have been reported. A possible contributing factor to these varying results may be found in the diversity of designs and in the statistical analyses.

Some examples are: type of exposure (network 2G/3G and a real mobile phone versus a radiating module), duration of exposure (ranging from minutes to several hours), and statistical tests (parametric versus non-parametric tests). Apart from these methodological aspects, it has been suggested that source of funding might influence the results [16]. It has been shown that 87% of brain activity studies are sponsored by the mobile phone industry [4]. Although this does not necessarily imply that the results of these articles are biased, the issue of conflict of interest cannot be neglected.

To shed further light on this topic, it was decided to set up a basic experiment to investigate whether EEG is influenced by mobile phone radiation. The focus on EEG as the dependent variable was deliberate since functioning of brain tissue is based on electrochemical processes [17] and interference by an electromagnetic device (mobile phone) placed directly against the head is, from a physical point of view, very likely to occur. Despite this plausible physical interference mechanism, adverse effects are rarely reported.

Before setting up the experiment, several methodological issues were considered. First, in most studies a control session was included on a separate day [12–15,18]. It is known, however, that resting EEGs can differ across days, even without any intervention [19]. Therefore, it was decided to compare an exposure condition with two control measurements, directly preceding and following the exposure condition. In addition, a control-exposure-control session was conducted on two different days in order to test whether the location of placement of the mobile phone might be of influence. Apart from the obvious placement of the mobile phone on the ear, it was decided to also place the phone on the chest. Any differences in outcome between placement locations may be informative about a working mechanism. Third, an actual mobile phone was used instead of a GSM module or other method to simulate mobile phone radiation. This decision was made to represent reality as accurately as possible. In order to ensure that the radiation did not have a direct effect on the measurement equipment, shielded EEG electrodes were used. Finally, multilevel random regression analysis was used instead of ANOVA techniques. The main reason is that EEG data show hierarchical clustering in at least four levels: subjects, sessions, conditions and EEG segments. Multilevel regression analysis also allows modulation of random effects (regression coefficients may vary between subjects) as well as the incorporation of an autoregressive covariance structure (since consecutive EEG segments are highly correlated).

Two a priori hypotheses were tested. Based on existing literature, an increase in alpha activity during exposure was expected. Second, because of the smaller distance to the brain, the influence on the EEG of radiation was expected to be larger with ear placement as compared to chest placement.

Discussion

In this placebo-controlled, single-blind, cross-over study, we investigated whether a 15 minute RF-EMF exposure by a 3G mobile phone impacts EEG activity. It was demonstrated that the results (and conclusions) strongly depend on the method of analysis. Analysed in the traditional fashion, that is, not controlling for the nested structure of the data, no significant differences could be demonstrated (see Table 2), a finding which is in accordance with several other studies [18,25–28]. However, when the data were analysed with an appropriate multilevel statistical model, 'radiation' proved to be a significant predictor of the alpha, slow beta, fast beta, and gamma frequency bands over almost all brain regions (Figs (Figs11 and and2).2). There is a trend for the radiation effect to be stronger on the ipsilateral side. The positive significant time effect (segment) within conditions, observed in all regions and frequency bands, was unexpected and an explanation is lacking at this moment. Guided by the significant

placement*radiation interactions, separate analyses for the ear and heart placements made clear that the radiation effect was mainly present in sessions where the mobile phone was placed on the ear (Figs (Figs33 and and4).4). To our knowledge, this ear-heart contrast has not been studied before. The present data suggest that a greater distance to the brain in case of the chest placement results in less EEG effects.

Although there are some studies which found an increase in the alpha frequency band due to RF-EMF [9–15], the extent to which the different EEG bands are affected in the present study has not been reported in literature to date. This discrepancy needs clarification and probably has to be sought in methodological differences with other studies. As mentioned above, the type of statistical approach is an important factor in this issue. The multilevel approach is the preferred approach given the present study design. As stated in the introduction, this approach allows for modelling clustered data, to correct for autocorrelation, and for modelling random effects. In addition, in this study radiation was used as the predictor of primary interest instead of a general condition (exposed vs. non-exposed conditions) effect. This was made possible by connecting the radiation detector to the amplifier. Another methodological difference may lie in the usage of shielded electrodes (most articles do not describe this specific information) which prevents a direct influence of RF-EMF on the wires. Yet another difference is that in the present study an actual mobile phone was used functioning within the UMTS bandwidth (instead of 2G). The studies which also used UMTS do not find EEG effects [18,27,29]. A final difference pertains to the control measurement. Whereas most studies had the control session on a separate day, the present study used a crossover moment in the same session, directly preceding and following the exposure session.

Some limitations have to be considered. First, the study was performed with adult female subjects only. The generalizability of the results to, for example, male subjects, children, and the elderly has to be demonstrated in future research. Second, a sample size of thirty-one is relatively small. Future studies with larger sample sizes are required. Two other critical points are exposure time and follow up measurements. In this study, only one exposure condition (15 minutes) was used and a (long term) follow up measurement was not included. It would be interesting to investigate what the effects are of other (shorter or longer) exposure periods to mobile phone radiation, as well as to find out what the effects are of frequent experimental exposure to radiation in the long term. Fifth, no inner ear temperature was measured. As there is evidence that mobile phones cause a thermal, heating effect [30], it could be argued that inner ear temperature fluctuations between the conditions may have confounded the findings. On the other hand, it has also been reported that any changes in cerebral blood flow due to mobile phone radiation, assessed by positron emission tomography, are unlikely to be temperature-related [31,32]. This issue needs further investigation. Sixth, the experiment was performed in a non-shielded room, thus including environmental background radiation. It would be ideal to carry out such experiments in a radiation-free environment. As a seventh point of concern, in retrospect it would have been preferable to not enter the experimenting room in-between conditions to change phones. Ideally the phone should be programmed from outside the room. Furthermore, a note should be made with respect to the number of tests performed. For example, Fig 1 contains eighteen test results. When corrected with the Bonferroni procedure, only two p-values (slow-beta left and midline) would remain significant. However, at least some of the findings would hold up under such a correction and it should be noted that the Bonferroni method is actually overly conservative for multiple correlated tests. [33] Instead, the ‘False discovery rate’ (FDR) was used to correct for multiple testing.

Most results were still significant after correction. Finally, information on other (psycho)physiological and biological measures may be included in future work.

The question is whether the (temporary) EEG changes, induced by mobile phone radiation, have clinical/adverse consequences. Answering this question is complex and beyond the scope of the present manuscript. First, it is unknown whether mobile phones change EEG activity in the long term. Second, EEG is a reflection of very complex cerebral processes. It is thought that the activity in the different frequency bands represents underlying cortical functions. An example is the thalamocortical network, which plays an important role in the generation of alpha activity [34]. Beta activity, however, only plays a role in the cortex and can, for example, be related to active concentration [35]. Since the functional role of the different frequency bands is still not fully understood, it is also hard to draw conclusions on the (clinical) implications of EEG changes.

In future studies other indicators of brain activity may be included. For example, transcranial magnetic stimulation is a method to test brain excitability. There are several indications that brain excitability is modified due to mobile phone radiation [36–38].

This study attempted to approach the question whether or not mobile phones cause (short-term) changes in EEG activity. There was evidence that mobile phone radiation is associated with increased activity of the alpha, beta, and gamma frequency bands in nearly every brain region. The distance of the mobile phone to the brain was relevant, a larger distance resulting in less or no EEG interference. Replication of the present findings and investigation of possible long term (clinically relevant) effects is urgently required.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4459698/

Effects of radiofrequency electromagnetic fields on the human nervous system

Abstract

The effects of exposure to radiofrequency electromagnetic fields (EMF), specifically related to the use of mobile telephones, on the nervous system in humans have been the subject of a large number of experimental studies in recent years. There is some evidence of an effect of exposure to a Global System for Mobile Telecommunication (GSM)-type signal on the spontaneous electroencephalogram (EEG). This is not corroborated, however, by the results from studies on evoked potentials. Although there is some evidence emerging that there may be an effect of exposure to a GSM-type signal on sleep EEG, results are still variable. In summary, exposure to a GSM-type signal may result in minor effects on brain activity, but such changes have never been found to relate to any adverse health effects. No consistent significant effects on cognitive performance in adults have been observed. If anything, any effect is small and exposure seems to improve performance. Effects in children did not differ from those in healthy adults. Studies on auditory and vestibular function are more unequivocal: neither hearing nor the sense of balance is influenced by short-term exposure to mobile phone signals. Subjective symptoms over a wide range, including headaches and migraine, fatigue, and skin itch, have been attributed to various radiofrequency sources both at home and at work. However, in provocation studies a causal relation between EMF exposure and symptoms has never been demonstrated. There are clear indications, however, that psychological factors such as the conscious expectation of effect may play an important role in this condition.

https://www.ncbi.nlm.nih.gov/pubmed/20183535

Evaluation of Mobile Phone and Cordless Phone Use and Glioma Risk Using the Bradford Hill Viewpoints from 1965 on Association or Causation

Abstract

Objective. Bradford Hill's viewpoints from 1965 on association or causation were used on glioma risk and use of mobile or cordless phones. Methods. All nine viewpoints were evaluated based on epidemiology and laboratory studies. Results. Strength: meta-analysis of case-control studies gave odds ratio (OR) = 1.90, 95% confidence interval (CI) = 1.31-2.76 with highest cumulative exposure. Consistency: the risk increased with latency, meta-analysis gave in the 10+ years' latency group OR = 1.62, 95% CI = 1.20-2.19. Specificity: increased risk for glioma was in the temporal lobe. Using meningioma cases as comparison group still increased the risk. Temporality: highest risk was in the 20+ years' latency group, OR = 2.01, 95% CI =1.41-2.88, for wireless phones. Biological gradient: cumulative use of wireless phones increased the risk. Plausibility: animal studies showed an increased incidence of glioma and malignant schwannoma in rats exposed to radiofrequency (RF) radiation. There is increased production of reactive oxygen species (ROS) from RF radiation. Coherence: there is a change in the natural history of glioma and increasing incidence. Experiment: antioxidants reduced ROS production from RF radiation. Analogy: there is an increased risk in subjects exposed to extremely low-frequency electromagnetic fields. Conclusion. RF radiation should be regarded as a human carcinogen causing glioma.

https://www.ncbi.nlm.nih.gov/pubmed/28401165

Fetal radiofrequency radiation exposure from 800-1900 mhz-rated cellular telephones affects neurodevelopment and behavior in mice

Abstract

Neurobehavioral disorders are increasingly prevalent in children, however their etiology is not well understood. An association between prenatal cellular telephone use and hyperactivity in children has been postulated, yet the direct effects of radiofrequency radiation exposure on neurodevelopment remain unknown. Here we used a mouse model to demonstrate that in-utero radiofrequency exposure from cellular telephones does affect adult behavior. Mice exposed in-utero were hyperactive and had impaired memory as determined using the object recognition, light/dark box and step-down assays. Whole cell patch clamp recordings of miniature excitatory postsynaptic currents (mEPSCs) revealed that these behavioral changes were due to altered neuronal developmental programming. Exposed mice had dose-responsive impaired glutamatergic synaptic transmission onto layer V pyramidal neurons of the prefrontal cortex. We present the first experimental evidence of neuropathology due to in-utero cellular telephone radiation. Further experiments are needed in humans or non-human primates to determine the risk of exposure during pregnancy.

https://www.ncbi.nlm.nih.gov/pubmed/22428084

Prenatal and Postnatal Cell Phone Exposures and Headaches in Children

Abstract

OBJECTIVE:
Children today are exposed to cell phones early in life, and may be at the greatest risk if exposure is harmful to health. We investigated associations between cell phone exposures and headaches in children.

STUDY DESIGN:
The Danish National Birth Cohort enrolled pregnant women between 1996 and 2002. When their children reached age seven years, mothers completed a questionnaire regarding the child's health, behaviors, and exposures. We used multivariable adjusted models to relate prenatal only, postnatal only, or both prenatal and postnatal cell phone exposure to whether the child had migraines and headache-related symptoms.

RESULTS:
Our analyses included data from 52,680 children. Children with cell phone exposure had higher odds of migraines and headache-related symptoms than children with no exposure. The odds ratio for migraines was 1.30 (95% confidence interval: 1.01-1.68) and for headache-related symptoms was 1.32 (95% confidence interval: 1.23-1.40) for children with both prenatal and postnatal exposure.

CONCLUSIONS:
In this study, cell phone exposures were associated with headaches in children, but the associations may not be causal given the potential for uncontrolled confounding and misclassification in observational studies such as this. However, given the widespread use of cell phones, if a causal effect exists it would have great public health impact.

https://www.ncbi.nlm.nih.gov/pubmed/23750182

Reduction of Phosphorylated Synapsin I (Ser-553) Leads to Spatial Memory Impairment by Attenuating GABA Release after Microwave Exposure in Wistar Rats

Abstract

Background

Abnormal release of neurotransmitters after microwave exposure can cause learning and memory deficits. This study investigated the mechanism of this effect by exploring the potential role of phosphorylated synapsin I (p-Syn I).

Methods

Wistar rats, rat hippocampal synaptosomes, and differentiated (neuronal) PC12 cells were exposed to microwave radiation for 5 min at a mean power density of 30 mW/cm^2. Sham group rats, synaptosomes, and cells were otherwise identically treated and acted as controls for all of the following post-exposure analyses. Spatial learning and memory in rats was assessed using the Morris Water Maze (MWM) navigation task. The protein expression and presynaptic distribution of p-Syn I and neurotransmitter transporters were examined via western blotting and immunoelectron microscopy, respectively. Levels amino acid neurotransmitter release from rat hippocampal synaptosomes and PC12 cells were measured using high performance liquid chromatograph (HPLC) at 6 hours after exposure, with or without synapsin I silencing via shRNA transfection.

Results

In the rat experiments, there was a decrease in spatial memory performance after microwave exposure. The expression of p-Syn I (ser-553) was decreased at 3 days post-exposure and elevated at later time points. Vesicular GABA transporter (VGAT) was significantly elevated after exposure. The GABA release from synaptosomes was attenuated and p-Syn I (ser-553) and VGAT were both enriched in small clear synaptic vesicles, which abnormally assembled in the presynaptic terminal after exposure. In the PC12 cell experiments, the expression of p-Syn I (ser-553) and GABA release were both attenuated at 6 hours after exposure. Both microwave exposure and p-Syn I silencing reduced GABA release and maximal reduction was found for the combination of the two, indicating a synergetic effect.

Conclusion

p-Syn I (ser-553) was found to play a key role in the impaired GABA release and cognitive dysfunction that was induced by microwave exposure.

http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0095503

Purkinje cell number decreases in the adult female rat cerebellum following exposure to 900 MHz electromagnetic field

Abstract

The biological effects of electromagnetic field (EMF) exposure from mobile phones have growing concern among scientists since there are some reports showing increased risk for human health, especially in the use of mobile phones for a long duration. In the presented study, the effects on the number of Purkinje cells in the cerebellum of 16-week (16 weeks) old female rats were investigated following exposure to 900 MHz EMF. Three groups of rats, a control group (CG), sham exposed group (SG) and an electromagnetic field exposed group (EMFG) were used in this study. While EMFG group rats were exposed to 900 MHz EMF (1h/day for 28 days) in an exposure tube, SG was placed in the exposure tube but not exposed to EMF (1h/day for 28 days). The specific energy absorption rate (SAR) varied between 0.016 (whole body) and 2 W/kg (locally in the head). The CG was not placed into the exposure tube nor was it exposed to EMF during the study period. At the end of the experiment, all of the female rats were sacrificed and the number of Purkinje cells was estimated using a stereological counting technique. Histopathological evaluations were also done on sections of the cerebellum. Results showed that the total number of Purkinje cells in the cerebellum of the EMFG was significantly lower than those of CG ($p<0.004$) and SG ($p<0.002$). In addition, there was no significant difference at the 0.05 level between the rats' body and brain weights in the EMFG and CG or SG. Therefore, it is suggested that long duration exposure to 900 MHz EMF leads to decreases of Purkinje cell numbers in the female rat cerebellum.

https://www.ncbi.nlm.nih.gov/pubmed/20691167

The 2100MHz radiofrequency radiation of a 3G-mobile phone and the DNA oxidative damage in brain

Abstract

We aimed to evaluate the effect of 2100MHz radiofrequency radiation emitted by a generator, simulating a 3G-mobile phone on the brain of rats during 10 and 40 days of exposure. The female rats were randomly divided into four groups. Group I; exposed to 3G modulated 2100MHz RFR signal for 6h/day, 5 consecutive days/wk for 2 weeks, group II; control 10 days, were kept in an inactive exposure set-up for 6h/day, 5 consecutive days/wk for 2 weeks, group III; exposed to 3G modulated 2100MHz RFR signal for 6h/day, 5 consecutive days/wk for 8 weeks and group IV; control 40 days, were kept in an inactive exposure set-up for 6h/day, 5 consecutive days/wk for 8 weeks. After the genomic DNA content of brain was extracted, oxidative DNA damage (8-hydroxy-2'deoxyguanosine, pg/mL) and malondialdehyde (MDA, nmoL/g tissue) levels were determined. Our main finding was the increased oxidative DNA damage to brain after 10 days of exposure with the decreased oxidative DNA damage following 40 days of exposure compared to their control groups. Besides decreased lipid peroxidation end product, MDA, was observed after 40 days of exposure. The measured decreased quantities of damage during the 40 days of exposure could be the means of adapted and increased DNA repair mechanisms.

https://www.ncbi.nlm.nih.gov/pubmed/26775761

Association between number of cell phone contracts and brain tumor incidence in nineteen U.S. States

Abstract

Some concern has arisen about adverse health effects of cell phones, especially the possibility that the low power microwave-frequency signal transmitted by the antennas on handsets might cause brain tumors or accelerate the growth of subclinical tumors. We analyzed data from the Statistical Report: Primary Brain Tumors in the United States, 2000–2004 and 2007 cell phone subscription data from the Governing State and Local Sourcebook. There was a significant correlation between number of cell phone subscriptions and brain tumors in nineteen US states ($r = 0.950$, $P < 0.001$). Because increased numbers of both cell phone subscriptions and brain tumors could be due solely to the fact that some states, such as New York, have much larger populations than other states, such as North Dakota, multiple linear regression was performed with number of brain tumors as the dependent variable, cell phone subscriptions, population, mean family income and mean age as independent variables. The effect of cell phone subscriptions was significant ($P = 0.017$), and independent of the effect of mean family income ($P = 0.894$), population ($P = 0.003$) and age (0.499). The very linear relationship between cell phone usage and brain tumor incidence is disturbing and certainly needs further epidemiological evaluation. In the meantime, it would be prudent to limit exposure to all sources of electro-magnetic radiation.

https://link.springer.com/article/10.1007/s11060-010-0280-z

Effects of mobile phone radiation (900 MHz radiofrequency) on structure and functions of rat brain

Abstract

OBJECTIVES:
The goals of this study were: (1) to obtain basic information about the effects of long-term use of mobile phones on cytological makeup of the hippocampus in rat brains (2) to evaluate the effects on antioxidant status, and (3) to evaluate the effects on cognitive behavior particularly on learning and memory.

METHODS:
Rats (age 30 days, 120 ± 5 g) were exposed to 900 MHz radio waves by means of a mobile hand set for 4 hours per day for 15 days. Effects on anxiety, spatial learning, and memory were studied using the open field test, the elevated plus maze, the Morris water maze (MWM), and the classic maze test. Effects on brain antioxidant status were also studied. Cresyl violet staining was done to assess the neuronal damage.

RESULT:
A significant change in behavior, i.e., more anxiety and poor learning was shown by test animals as compared to controls and sham group. A significant change in the level of antioxidant enzymes and non-enzymatic antioxidants, and an increase in lipid peroxidation were observed in the test rats. Histological examination showed neurodegenerative cells in hippocampal sub regions and the cerebral cortex.

DISCUSSION:
Thus our findings indicate extensive neurodegeneration on exposure to radio waves. Increased production of reactive oxygen species due to exhaustion of enzymatic and non-enzymatic antioxidants and increased lipid peroxidation indicate extensive neurodegeneration in selective areas of CA1, CA3, DG, and the cerebral cortex. This extensive neuronal damage results in alterations in behavior related to memory and learning.

https://www.ncbi.nlm.nih.gov/pubmed/24861496

A Challenging Issue in the Etiology of Speech Problems: The Effect of Maternal Exposure to Electromagnetic Fields on Speech Problems in the Offspring

Abstract

Background

Nowadays, mothers are continuously exposed to different sources of electromagnetic fields before and even during pregnancy. It has recently been shown that exposure to mobile phone radiation during pregnancy may lead to adverse effects on the brain development in offspring and cause hyperactivity. Researchers have shown that behavioral problems in laboratory animals which have a similar appearance to ADHD are caused by intrauterine exposure to mobile phones.

Objective

The purpose of this study was to investigate whether the maternal exposure to different sources of electromagnetic fields affect on the rate and severity of speech problems in their offspring.

Methods

In this study, mothers of 35 healthy 3-5 year old children (control group) and 77 children and diagnosed with speech problems who had been referred to a speech treatment center in Shiraz, Iran were interviewed. These mothers were asked whether they had exposure to different sources of electromagnetic fields such as mobile phones, mobile base stations, Wi-Fi, cordless phones, laptops and power lines.

Results

We found a significant association between either the call time (P=0.002) or history of mobile phone use (months used) and speech problems in the offspring (P=0.003). However, other exposures had no effect on the occurrence of speech problems. To the best of our knowledge, this is the first study to investigate a possible association between maternal exposure to electromagnetic field and speech problems in the offspring. Although a major limitation in our study is the relatively small sample size, this study indicates that the maternal exposure to common sources of electromagnetic fields such as mobile phones can affect the occurrence of speech problems in the offspring.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4576876/

Effects of Cell Phone Radiofrequency Signal Exposure on Brain Glucose Metabolism

Abstract

Context

The dramatic increase in use of cellular telephones has generated concern about possible negative effects of radiofrequency signals delivered to the brain. However, whether acute cell phone exposure affects the human brain is unclear.

Objective

To evaluate if acute cell phone exposure affects brain glucose metabolism, a marker of brain activity.

Design, Setting, and Participants

Randomized crossover study conducted between January 1 and December 31, 2009, at a single US laboratory among 47 healthy participants recruited from the community. Cell phones were placed on the left and right ears and positron emission tomography with (18F)fluorodeoxyglucose injection was used to measure brain glucose metabolism twice, once with the right cell phone activated (sound muted) for 50 minutes ("on" condition) and once with both cell phones deactivated ("off" condition). Statistical parametric mapping was used to compare metabolism between on and off conditions using paired t tests, and Pearson linear correlations were used to verify the association of metabolism and estimated amplitude of radiofrequency-modulated electromagnetic waves emitted by the cell phone. Clusters with at least 1000 voxels (volume >8 cm3) and P < .05 (corrected for multiple comparisons) were considered significant.

Main Outcome Measure

Brain glucose metabolism computed as absolute metabolism (µmol/100 g per minute) and as normalized metabolism (region/whole brain).

Results

Whole-brain metabolism did not differ between on and off conditions. In contrast, metabolism in the region closest to the antenna (orbitofrontal cortex and temporal pole) was significantly higher for on than off conditions (35.7 vs 33.3 µmol/100 g per minute; mean difference, 2.4 [95% confidence interval, 0.67–4.2]; P = .004). The increases were significantly correlated with the estimated electromagnetic field amplitudes both for absolute metabolism (R = 0.95, P < .001) and normalized metabolism (R = 0.89; P < .001).

Conclusions

In healthy participants and compared with no exposure, 50-minute cell phone exposure was associated with increased brain glucose metabolism in the region closest to the antenna. This finding is of unknown clinical significance.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3184892/

900 MHz electromagnetic field exposure affects qualitative and quantitative features of hippocampal pyramidal cells in the adult female rat

Abstract

The effects of electromagnetic fields (EMFs) emitted by mobile phones on humans hold special interest due to their use in close proximity to the brain. The current study investigated the number of pyramidal cells in the cornu ammonis (CA) of the 16-week-old female rat hippocampus following postnatal exposure to a 900 megahertz (MHz) EMF. In this study were three groups of 6 rats: control (Cont), sham exposed (Sham), and EMF exposed (EMF). EMF group rats were exposed to 900 MHz EMF (1 h/day for 28 days) in an exposure tube. Sham group was placed in the exposure tube but not exposed to EMF (1 h/day for 28 days). Cont group was not placed into the exposure tube nor were they exposed to EMF during the study period. In EMF group rats, the specific energy absorption rate (SAR) varied between 0.016 (whole body) and 2 W/kg (locally in the head). All of the rats were sacrificed at the end of the experiment and the number of pyramidal cells in the CA was estimated using the optical fractionator technique. Histopathological evaluations were made on sections of the CA region of the hippocampus. Results showed that postnatal EMF exposure caused a significant decrease of the pyramidal cell number in the CA of the EMF group ($P<0.05$). Additionally, cell loss can be seen in the CA region of EMF group even at qualitative observation. These results may encourage researchers to evaluate the chronic effects of 900 MHz EMF on teenagers' brains.

https://www.ncbi.nlm.nih.gov/pubmed/19230827

Chronic prenatal exposure to the 900 megahertz electromagnetic field induces pyramidal cell loss in the hippocampus of newborn rats

Abstract

Widespread use of mobile phones which are a major source of electromagnetic fields might affect living organisms. However, there has been no investigation concerning prenatal exposure to electromagnetic fields or their roles in the development of the pyramidal cells of the cornu ammonis in postnatal life. Two groups of pregnant rats, a control group and an experimental group, that were exposed to an electromagnetic field were used. For obtaining electromagnetic field offspring, the pregnant rats were exposed to 900 megahertz electromagnetic fields during the 1-19th gestation days. There were no actions performed on the control group during the same period. The offspring rats were spontaneously delivered--control group ($n = 6$) and electromagnetic field group ($n = 6$). Offspring were sacrificed for stereological analyses at the end of the 4th week. Pyramidal cell number in rat cornu ammonis was estimated using the optical fractionator technique. It was found that 900 megahertz of electromagnetic field significantly reduced the total pyramidal cell number in the cornu ammonis of the electromagnetic field group ($P < 0.001$). Therefore, although its exact mechanism is not clear, it is suggested that pyramidal cell loss in the cornu ammonis could be due to the 900 megahertz electromagnetic field exposure in the prenatal period.

https://www.ncbi.nlm.nih.gov/pubmed/19671630

Mobile Phone Use, Blood Lead Levels, and Attention Deficit Hyperactivity Symptoms in Children: A Longitudinal Study

Abstract

Background

Concerns have developed for the possible negative health effects of radiofrequency electromagnetic field (RF-EMF) exposure to children's brains. The purpose of this longitudinal study was to investigate the association between mobile phone use and symptoms of Attention Deficit Hyperactivity Disorder (ADHD) considering the modifying effect of lead exposure.

Methods

A total of 2,422 children at 27 elementary schools in 10 Korean cities were examined and followed up 2 years later. Parents or guardians were administered a questionnaire including the Korean version of the ADHD rating scale and questions about mobile phone use, as well as socio-demographic factors. The ADHD symptom risk for mobile phone use was estimated at two time points using logistic regression and combined over 2 years using the generalized estimating equation model with repeatedly measured variables of mobile phone use, blood lead, and ADHD symptoms, adjusted for covariates.

Results

The ADHD symptom risk associated with mobile phone use for voice calls but the association was limited to children exposed to relatively high lead.

Conclusions

The results suggest that simultaneous exposure to lead and RF from mobile phone use was associated with increased ADHD symptom risk, although possible reverse causality could not be ruled out.

http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0059742

Effect of low level microwave radiation exposure on cognitive function and oxidative stress in rats

Abstract

Use of wireless communicating devices is increasing at an exponential rate in present time and is raising serious concerns about possible adverse effects of microwave (MW) radiation emitted from these devices on human health. The present study aimed to evaluate the effects of 900 MHz MW radiation exposure on cognitive function and oxidative stress in blood of Fischer rats. Animals were divided into two groups (6 animals/group): Group I (MW-exposed) and Group II (Sham-exposed). Animals were subjected to MW exposure (Frequency 900 MHz; specific absorption rate 8.4738 x 10(-5) W/kg) in Gigahertz transverse electromagnetic cell (GTEM) for 30 days (2 h/day, 5 days/week). Subsequently, cognitive function and oxidative stress parameters were examined for each group. Results showed significant impairment in cognitive function and increase in oxidative stress, as evidenced by the increase in levels of MDA (a marker of lipid peroxidation) and protein carbonyl (a marker of protein oxidation) and unaltered GSH content in blood. Thus, the study demonstrated that low level MW radiation had significant effect on cognitive function and was also capable of leading to oxidative stress.

https://www.ncbi.nlm.nih.gov/pubmed/23720885

Cognitive impairment and neurogenotoxic effects in rats exposed to low-intensity microwave radiation

Abstract

The health hazard of microwave radiation (MWR) has become a recent subject of interest as a result of the enormous increase in mobile phone usage. The present study aimed to investigate the effects of chronic low-intensity microwave exposure on cognitive function, heat shock protein 70 (HSP70), and DNA damage in rat brain. Experiments were performed on male Fischer rats exposed to MWR for 180 days at 3 different frequencies, namely, 900, 1800 MHz, and 2450 MHz. Animals were divided into 4 groups: group I: sham exposed; group II: exposed to MWR at 900 MHz, specific absorption rate (SAR) 5.953 × 10(-4) W/kg; group III: exposed to 1800 MHz, SAR 5.835 × 10(-4) W/kg; and group IV: exposed to 2450 MHz, SAR 6.672 × 10(-4) W/kg. All the rats were tested for cognitive function at the end of the exposure period and were subsequently sacrificed to collect brain. Level of HSP70 was estimated by enzyme-linked immunotarget assay and DNA damage was assessed using alkaline comet assay in all the groups. The results showed declined cognitive function, elevated HSP70 level, and DNA damage in the brain of microwave-exposed animals. The results indicated that, chronic low-intensity microwave exposure in the frequency range of 900 to 2450 MHz may cause hazardous effects on the brain.

https://www.ncbi.nlm.nih.gov/pubmed/25749756

Maternal mobile phone exposure alters intrinsic electrophysiological properties of CA1 pyramidal neurons in rat offspring

Abstract

Some studies have shown that exposure to electromagnetic field (EMF) may result in structural damage to neurons. In this study, we have elucidated the alteration in the hippocampal function of offspring Wistar rats (n = 8 rats in each group) that were chronically exposed to mobile phones during their gestational period by applying behavioral, histological, and electrophysiological tests. Rats in the EMF group were exposed to 900 MHz pulsed-EMF irradiation for 6 h/day. Whole cell recordings in hippocampal pyramidal cells in the mobile phone groups did show a decrease in neuronal excitability. Mobile phone exposure was mostly associated with a decrease in the number of action potentials fired in spontaneous activity and in response to current injection in both male and female groups. There was an increase in the amplitude of the afterhyperpolarization (AHP) in mobile phone rats compared with the control. The results of the passive avoidance and Morris water maze assessment of learning and memory performance showed that phone exposure significantly altered learning acquisition and memory retention in male and female rats compared with the control rats. Light microscopy study of brain sections of the control and mobile phone-exposed rats showed normal morphology.Our results suggest that exposure to mobile phones adversely affects the cognitive performance of both female and male offspring rats using behavioral and electrophysiological techniques.

https://www.ncbi.nlm.nih.gov/pubmed/24604340

Neurodegenerative changes and apoptosis induced by intrauterine and extrauterine exposure of radiofrequency radiation

Abstract

Adverse health effects of radiofrequency radiation (RFR) on the ongoing developmental stages of children from conception to childhood are scientifically anticipated subject. This study was performed to identify the effects of global system for mobile communications (GSM) modulated mobile phone like RFR in 1800MHz frequency on oxidative DNA damage and lipid peroxidation beside the apoptotic cell formation, using histopathological and immunohistochemical methods in the brain tissue of 1-month-old male and female New Zealand White rabbits that were exposed to these fields at their mother's womb and after the birth. Oxidative DNA damage and lipid peroxidation levels were investigated by measuring the 8-hydroxy-2'-deoxyguanosine (8-OHdG) and malondialdehyde (MDA) levels, respectively. Histopathological changes were observed using by hematoxylin and eosin (HE) staining. Apoptotic cells were detected in the examined organs by terminal deoxynucleotidyl transferase-mediated dUTP nick end-labeling (TUNEL) staining. For both male and female infants; 8-OHdG levels increased in the group exposed to RFR in both intrauterine and extrauterine periods compared to the infants that were never exposed to RFR and the ones were exposed when they reached one month of age ($p<0.05$). MDA results were different for male and female rabbits. There was no difference between all female infant groups ($p>0.05$), while only intrauterine exposure significantly causes MDA level increase for the male infants. HE staining revealed mild lessions in neuronal necrobiosis in brain tissues of female rabbits that had only intaruterine exposure and male rabbits had only extrauterine exposure. Gliosis were mildly positive in brain tissues of rabbits that are exposed only intrauterine period, also the group exposed both intrauterine and extrauterine periods. However, there was no apoptotic change detected by TUNEL staining in the brain tissues of all groups.

https://www.ncbi.nlm.nih.gov/pubmed/26520616

Effects of radiofrequency radiation exposure on blood-brain barrier permeability in male and female rats

Abstract

During the last several decades, numerous studies have been performed aiming at the question of whether or not exposure to radiofrequency radiation (RFR) influences the permeability of the blood-brain barrier (BBB). The objective of this study was to investigate the effect of RFR on the permeability of BBB in male and female Wistar albino rats. Right brain, left brain, cerebellum, and total brain were analyzed separately in the study. Rats were exposed to 0.9 and 1.8 GHz continuous-wave (CW) RFR for 20 min (at SARs of 4.26 mW/kg and 1.46 mW/kg, respectively) while under anesthesia. Control rats were sham-exposed. Disruption of BBB integrity was detected spectrophotometrically using the Evans-blue dye, which has been used as a BBB tracer and is known to be bound to serum albumin. Right brain, left brain, cerebellum, and total brain were evaluated for BBB permeability. In female rats, no albumin extravasation was found in in the brain after RFR exposure. A significant increase in albumin was found in the brains of the RF-exposed male rats when compared to sham-exposed male brains. These results suggest that exposure to 0.9 and 1.8 GHz CW RFR at levels below the international limits can affect the vascular permeability in the brain of male rats. The possible risk of RFR exposure in humans is a major concern for the society. Thus, this topic should be investigated more thoroughly in the future.

https://www.ncbi.nlm.nih.gov/pubmed/22047463

Effects of prenatal exposure to a 900 MHz electromagnetic field on the dentate gyrus of rats: a stereological and histopathological study

Abstract

Electromagnetic fields (EMFs) inhibit the formation and differentiation of neural stem cells during embryonic development. In this study, the effects of prenatal exposure to EMF on the number of granule cells in the dentate gyrus of 4-week-old rats were investigated. This experiment used a control (Cont) group and an EMF exposed (EMF) group (three pregnant rats each group). The EMF group consisted of six offspring (n=6) of pregnant rats that were exposed to an EMF of up to 900 megahertz (MHz) for 60 min/day between the first and last days of gestation. The control group consisted of five offspring (n=5) of pregnant rats that were not treated at all. The offspring were sacrificed when they were 4 weeks old. The numbers of granule cells in the dentate gyrus were analyzed using the optical fractionator technique. The results showed that prenatal EMF exposure caused a decrease in the number of granule cells in the dentate gyrus of the rats ($P<0.01$). This suggests that prenatal exposure to a 900 MHz EMF affects the development of the dentate gyrus granule cells in the rat hippocampus. Cell loss might be caused by an inhibition of granule cell neurogenesis in the dentate gyrus.

https://www.ncbi.nlm.nih.gov/pubmed/18761003

Effects of prenatal and postnatal exposure to GSM-like radiofrequency on blood chemistry and oxidative stress in infant rabbits, an experimental study

Abstract

We aimed to investigate the potential hazardous effects of prenatal and/or postnatal exposure to 1800 MHz GSM-like radiofrequency radiation (RFR) on the blood chemistry and lipid peroxidation levels of infant rabbits. A total of 72 New Zealand female and male white rabbits aged 1-month were used. Thirty-six female and 36 male were divided into four groups which were composed of nine infants: (i) Group 1 were the sham exposure (control), (ii) Group 2 were exposed to RFR, 15 min daily for 7 days in the prenatal period (between 15th and 22nd days of the gestational period) (prenatal exposure group). (iii) Group 3 were exposed to RFR 15 min/day (14 days for male, whereas 7 days for female) after they reached 1-month of age (postnatal exposure group). (iv) Group 4 were exposed to RFR for 15 min daily during 7 days in the prenatal period (between 15th and 22nd days of the gestational period) and 15 min/day (14 days for male, whereas 7 days for female) after they reached 1-month of age (prenatal and postnatal exposure group). Results showed that serum lipid peroxidation level in both female and male rabbits changed due to the RFR exposure. However, different parameters of the blood biochemistry were affected by exposure in male and female infants. Consequently, the whole-body 1800 MHz GSM-like RFR exposure may lead to oxidative stress and changes on some blood chemistry parameters. Studies on RFR exposure during prenatal and postnatal periods will help to establish international standards for the protection of pregnants and newborns from environmental RFR.

https://www.ncbi.nlm.nih.gov/pubmed/23526187

Mobile phone use and risk for intracranial tumors and salivary gland tumors - A meta-analysis

Abstract

Results of epidemiological studies on the association between use of mobile phone and brain cancer are ambiguous, as well as the results of 5 meta-analysis studies published to date. Since the last meta-analysis (2009), new case-control studies have been published, which theoretically could affect the conclusions on this relationship. Therefore, we decided to perform a new meta-analysis. We conducted a systematic review of multiple electronic data bases for relevant publications. The inclusion criteria were: original papers, case-control studies, published till the end of March 2014, measures of association (point estimates as odds ratio and confidence interval of the effect measured), data on individual exposure. Twenty four studies (26 846 cases, 50 013 controls) were included into the meta-analysis. A significantly higher risk of an intracranial tumor (all types) was noted for the period of mobile phone use over 10 years (odds ratio (OR) = 1.324, 95% confidence interval (CI): 1.028-1.704), and for the ipsilateral location (OR = 1.249, 95% CI: 1.022-1.526). The results support the hypothesis that long-term use of mobile phone increases risk of intracranial tumors, especially in the case of ipsilateral exposure. Further studies are needed to confirm this relationship. Int J Occup Med Environ Health 2017;30(1)27-43.

https://www.ncbi.nlm.nih.gov/pubmed/28220905

Cell phone use and behavioral problems in young children

Abstract

BACKGROUND:
Potential health effects of cell phone use in children have not been adequately examined. As children are using cell phones at earlier ages, research among this group has been identified as the highest priority by both national and international organizations. The authors previously reported results from the Danish National Birth Cohort (DNBC), which looked at prenatal and postnatal exposure to cell phone use and behavioral problems at age 7 years. Exposure to cell phones prenatally, and to a lesser degree postnatally, was associated with more behavioral difficulties. The original analysis included nearly 13 000 children who reached age 7 years by November 2006.

METHODS:
To see if a larger, separate group of DNBC children would produce similar results after considering additional confounders, children of mothers who might better represent current users of cell phones were analyzed. This 'new' dataset consisted of 28 745 children with completed Age-7 Questionnaires to December 2008.

RESULTS:
The highest OR for behavioral problems were for children who had both prenatal and postnatal exposure to cell phones compared with children not exposed during either time period. The adjusted effect estimate was 1.5 (95% CI 1.4 to 1.7).

CONCLUSIONS:
The findings of the previous publication were replicated in this separate group of participants demonstrating that cell phone use was associated with behavioral problems at age 7 years in children, and this association was not limited to early users of the technology. Although weaker in the new dataset, even with further control for an extended set of potential confounders, the associations remained.

https://www.ncbi.nlm.nih.gov/pubmed/21138897

Prenatal and postnatal exposure to cell phone use and behavioral problems in children

Abstract

BACKGROUND:
The World Health Organization has emphasized the need for research into the possible effects of radiofrequency fields in children. We examined the association between prenatal and postnatal exposure to cell phones and behavioral problems in young children.

METHODS:
Mothers were recruited to the Danish National Birth Cohort early in pregnancy. When the children of those pregnancies reached 7 years of age in 2005 and 2006, mothers were asked to complete a questionnaire regarding the current health and behavioral status of children, as well as past exposure to cell phone use. Mothers evaluated the child's behavior problems using the Strength and Difficulties Questionnaire.

RESULTS:
Mothers of 13,159 children completed the follow-up questionnaire reporting their use of cell phones during pregnancy as well as current cell phone use by the child. Greater odds ratios for behavioral problems were observed for children who had possible prenatal or postnatal exposure to cell phone use. After adjustment for potential confounders, the odds ratio for a higher overall behavioral problems score was 1.80 (95% confidence interval = 1.45-2.23) in children with both prenatal and postnatal exposure to cell phones.

CONCLUSIONS:
Exposure to cell phones prenatally-and, to a lesser degree, postnatally-was associated with behavioral difficulties such as emotional and hyperactivity problems around the age of school entry. These associations may be noncausal and may be due to unmeasured confounding. If real, they would be of public health concern given the widespread use of this technology.

https://www.ncbi.nlm.nih.gov/pubmed/18467962

The influence of microwave radiation from cellular phone on fetal rat brain

Abstract

The increasing use of cellular phones in our society has brought focus on the potential detrimental effects to human health by microwave radiation. The aim of our study was to evaluate the intensity of oxidative stress and the level of neurotransmitters in the brains of fetal rats chronically exposed to cellular phones. The experiment was performed on pregnant rats exposed to different intensities of microwave radiation from cellular phones. Thirty-two pregnant rats were randomly divided into four groups: CG, GL, GM, and GH. CG accepted no microwave radiation, GL group radiated 10 min each time, GM group radiated 30 min, and GH group radiated 60 min. The 3 experimental groups were radiated 3 times a day from the first pregnant day for consecutively 20 days, and on the 21st day, the fetal rats were taken and then the contents of superoxide dismutase (SOD), glutathione peroxidase (GSH-Px), malondialdehyde (MDA), noradrenaline (NE), dopamine (DA), and 5-hydroxyindole acetic acid (5-HT) in the brain were assayed. Compared with CG, there were significant differences ($P<0.05$) found in the contents of SOD, GSH-Px, and MDA in GM and GH; the contents of SOD and GSH-Px decreased and the content of MDA increased. The significant content differences of NE and DA were found in fetal rat brains in GL and GH groups, with the GL group increased and the GH group decreased. Through this study, we concluded that receiving a certain period of microwave radiation from cellular phones during pregnancy has certain harm on fetal rat brains.

https://www.ncbi.nlm.nih.gov/pubmed/22268709

Possible cause for altered spatial cognition of prepubescent rats exposed to chronic radiofrequency electromagnetic radiation

Abstract

The effects of chronic and repeated radiofrequency electromagnetic radiation (RFEMR) exposure on spatial cognition and hippocampal architecture were investigated in prepubescent rats. Four weeks old male Wistar rats were exposed to RF-EMR (900 MHz; SAR-1.15 W/kg with peak power density of 146.60 µW/cm(2)) for 1 h/day, for 28 days. Followed by this, spatial cognition was evaluated by Morris water maze test. To evaluate the hippocampal morphology; H&E staining, cresyl violet staining, and Golgi-Cox staining were performed on hippocampal sections. CA3 pyramidal neuron morphology and surviving neuron count (in CA3 region) were studied using H&E and cresyl violet stained sections. Dendritic arborization pattern of CA3 pyramidal neuron was investigated by concentric circle method. Progressive learning abilities were found to be decreased in RF-EMR exposed rats. Memory retention test performed 24 h after the last training revealed minor spatial memory deficit in RF-EMR exposed group. However, RF-EMR exposed rats exhibited poor spatial memory retention when tested 48 h after the final trial. Hirano bodies and Granulovacuolar bodies were absent in the CA3 pyramidal neurons of different groups studied. Nevertheless, RF-EMR exposure affected the viable cell count in dorsal hippocampal CA3 region. RF-EMR exposure influenced dendritic arborization pattern of both apical and basal dendritic trees in RF-EMR exposed rats. Structural changes found in the hippocampus of RF-EMR exposed rats could be one of the possible reasons for altered cognition.

https://www.ncbi.nlm.nih.gov/pubmed/26033310

Maternal exposure to a continuous 900-MHz electromagnetic field provokes neuronal loss and pathological changes in cerebellum of 32-day-old female rat offspring

Abstract

Large numbers of people are unknowingly exposed to electromagnetic fields (EMF) from wireless devices. Evidence exists for altered cerebellar development in association with prenatal exposure to EMF. However, insufficient information is still available regarding the effects of exposure to 900 megahertz (MHz) EMF during the prenatal period on subsequent postnatal cerebellar development. This study was planned to investigate the 32-day-old female rat pup cerebellum following exposure to 900MHz EMF during the prenatal period using stereological and histopathological evaluation methods. Pregnant rats were divided into control, sham and EMF groups. Pregnant EMF group (PEMFG) rats were exposed to 900MHz EMF for 1h inside an EMF cage during days 13-21 of pregnancy. Pregnant sham group (PSG) rats were also placed inside the EMF cage during days 13-21 of pregnancy for 1h, but were not exposed to any EMF. No procedure was performed on the pregnant control group (PCG) rats. Newborn control group (CG) rats were obtained from the PCG mothers, newborn sham group (SG) rats from the PSG and newborn EMF group (EMFG) rats from the PEMFG rats. The cerebellums of the newborn female rats were extracted on postnatal day 32. The number of Purkinje cells was estimated stereologically, and histopathological evaluations were also performed on cerebellar sections. Total Purkinje cell numbers calculated using stereological analysis were significantly lower in EMFG compared to CG ($p<0.05$) and SG ($p<0.05$). Additionally, some pathological changes such as pyknotic neurons with dark cytoplasm were observed in EMFG sections under light microscopy. In conclusion, our study results show that prenatal exposure to EMF affects the development of Purkinje cells in the female rat cerebellum and that the consequences of this pathological effect persist after the postnatal period.

https://www.ncbi.nlm.nih.gov/pubmed/26391347

Microwave radiation induced oxidative stress, cognitive impairment and inflammation in brain of Fischer rats

Abstract

Public concerns over possible adverse effects of microwave radiation emitted by mobile phones on health are increasing. To evaluate the intensity of oxidative stress, cognitive impairment and inflammation in brain of Fischer rats exposed to microwave radiation, male Fischer-344 rats were exposed to 900 MHz microwave radiation (SAR = 5.953 x 10(-4) W/kg) and 1800 MHz microwave radiation (SAR = 5.835 x 10(-4) W/kg) for 30 days (2 h/day). Significant impairment in cognitive function and induction of oxidative stress in brain tissues of microwave exposed rats were observed in comparison with sham exposed groups. Further, significant increase in level of cytokines (IL-6 and TNF-alpha) was also observed following microwave exposure. Results of the present study indicated that increased oxidative stress due to microwave exposure may contribute to cognitive impairment and inflammation in brain.

https://www.ncbi.nlm.nih.gov/pubmed/23986973

Wi-Fi

Wi-Fi Radiation: An Invisible Threat to Your Health?

We have long been told that the form of radio frequency radiation that Wi-Fi devices utilize is non-ionizing. That is to say it doesn't have sufficient energy to break the bonds that hold molecules together, and that there is no heating effect… so therefore it is harmless. Or at least that's what we're told.

But thousands of peer reviewed studies now tell a different story. Wi-Fi radiation may not cause a thermal heating effect, and it might be non-ionizing – but it is far from harmless.

Independent research dating back some 80 years links Wi-Fi radiation to a long list of adverse biological effects, including:

- DNA chain breaks
- Increased blood-brain-barrier permeability
- Disruption to brain glucose metabolism
- Creation of stress proteins
- Disruption of cell metabolism

Studies also associate Wi-Fi radiation exposure with such symptoms as fatigue, irritability, headaches, and digestive disorders. Long-term exposure to Wi-Fi radiation has been linked with many serious diseases – including cancer.

Numerous studies link Wi-Fi radiation exposure with cancer. Notably, the German telecommunications company T-Mobile carried out a major independent study. It found that *"on the cellular level, a multitude of studies found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion."*

In 2011, the World Health Organization classified radio frequency radiation of the type used by Wi-Fi devices as a Group 2B possible carcinogen. A study conducted by the University of Vienna have found Wi-Fi exposures to cause genotoxicity as they break single and double strand DNAs in our body. This indicates that there are effects that may potentially surface with our future generations.

Safety standards do exist for radio frequency radiation emissions, but these standards are only based on thermal heating effects. That is to say they only consider these exposures to be harmful if they heat tissue. But these safety standards do not protect us from adverse biological effects which are thought to be the precursor to serious diseases. Scientists have already raised the alarm regarding this issue.

In 2015, scientists from around the world united for the *International EMF Scientist Appeal* based on the results of over 2,000 research papers. The appeal is the collective voice of 190 scientists from 39 different countries. They are calling for tighter regulations and more security measures when dealing with electromagnetic field exposures generally, and Wi-Fi in particular.

Last year, 15-year-old English schoolgirl Jenny Fry was found hanged in woodland near her home. According to her parents she suffered from electrical sensitivity, making it impossible for her to sit in Wi-Fi classrooms and have Wi-Fi at home. The school refused to remove the Wi-Fi. Speaking at the inquest her mother said, "I believe that Wi-Fi killed my daughter."

https://thetruthaboutcancer.com/Wi-Fi-radiation/

10 Shocking Facts about the Health Dangers of Wi-Fi

Wi-Fi is convenient but many have raised doubts concerning the safety of unseen forces that permeate everything around us. Since the introduction of Wi-Fi in 1997, researchers have performed dozens of studies to explore the subject. The results are clear and shocking — Wi-Fi can negatively affect overall health and brain health, especially in children.

Perhaps most shocking is that this information is not new or even that controversial. In fact, in 2008 the well-renowned publication Scientific American ran a piece called "Mind Control by Cell Phone" which explained the danger Wi-Fi has on the human brain. [1] Let's further explore the potential dangers of Wi-Fi with these 10 facts.

1. **Contributes to the development of insomnia**
   Have you ever felt more awake after using Wi-Fi or even struggled to sleep through the night? Reports of these phenomena have been frequent and even prompted a study in 2007 that evaluated low-frequency modulation from cell phones and its impact on sleep. Participants were exposed to the electromagnetic signals from real phones or no signal from fake phones. Those exposed to the electromagnetic radiation had a significantly more difficult time falling asleep and changes in brainwave patterns were observed. [2]

   It's been suggested that sleeping near a phone, in a home with Wi-Fi, or in an apartment building with many Wi-Fi signals can create chronic sleep problems as the constant bombardment of Wi-Fi pollution interferes with falling asleep and sleep patterns. For many, sleep deprivation is just the start for larger problems. The development of depression and hypertension have also been linked to inadequate sleep. [3]
2. **Damaging to Childhood Development**
   Exposure to non-thermal radio frequency radiation from Wi-Fi and cellular phones can disrupt normal cellular development, especially fetal development. A 2004 animal study linked exposure to delayed kidney development. [4] These findings were supported by a 2009 Austrian study. In fact, the disruption of protein synthesis is so severe that authors specifically noted, "This cell property is especially pronounced in growing tissues, that is, in children and youth. Consequently, these population groups would be more susceptible than average to the described effects." [5] In short, bathing the developmentally young in Wi-Fi increases their risk of developmental issues.
3. **Affects Cell Growth**
   When a group of Danish ninth graders experienced difficulty concentrating after sleeping with their cell phones by their head, they performed an experiment to test the effect of wireless Wi-Fi routers on garden cress. One set of plants was grown in a room free of wireless radiation; the other group grew next to two routers that released the same amount of radiation as a cell phone. The results? The plants nearest the radiation didn't grow. [6]
4. **Derails Brain Function**
   Just as the Danish high schoolers noticed problems with concentration, scientists have begun to look at the impact of 4G radiation on brain function. Using MRI technology, research performed just last year found that persons exposed to 4G radiation had several areas of reduced brain activity. [7]
5. **Reduces Brain Activity in Females**

A group of 30 healthy volunteers, 15 men and 15 women, were given a simple memory test. First, the entire group was tested without any exposure to Wi-Fi radiation — no problem. Then, they were exposed to 2.4 GHz Wi-Fi from a wireless access point for about 45 minutes. During that portion of the testing, brain activity was measured and the women had a noticeable change in brain activity and energy levels. [8] Sorry ladies! But guys, don't get too comfortable…

6. **Neutralizes Sperm**
   …Because we've known for a long time that the heat generated by laptops kills sperm. Well, now it turns out that heat isn't the only threat to a man's virility. Research has found exposure to Wi-Fi frequencies reduce sperm movement and cause DNA fragmentation. [9] Both human and animal testing has confirmed that exposure negatively affects sperm. [10] [11]
7. **May Impact Fertility**
   And, it's not just sperm. The results of an animal study suggest that some wireless frequencies may prevent egg implantation. During the study, mice exposed 2 hours a day for 45 days had significantly increased oxidative stress levels. The cellular damage and impact on DNA structure from exposure suggest a strong possibility of abnormal pregnancy or failure of the egg to implant. [12]

   The Karolinska Institute in Sweden released a warning in 2011, stating:
   - "Pregnant women are cautioned to avoid using wireless devices themselves and distance themselves from other users,"
   - "Current US [and Canada]…standards for radio frequency and microwave radiation from wireless technology are entirely inadequate," and
   - "Safety standards also ignore the developing fetus…" [13]
8. **Provokes Cardiac Stress**
   If you think your heart races when surrounded by wireless networks or 3G or LTE cell phones, it may not be in your head. A study involving 69 subjects reported that many of them experienced a real physical response to electromagnetic frequencies. Exactly what was the physical response? Increased heart rate — similar to the heart rate of an individual under stress. [14]
9. **Linked to Cancer?**
   This is extremely controversial but we can't ignore that plenty of animal models indicate that exposure to electromagnetic radiation increases the risk of tumor development. While human studies are rare, reports and case studies abound. One such case involves a young 21-year-old woman who developed breast cancer. What makes this case unique was that her family did not have a predisposition to breast cancer… and she developed the tumor right on the spot she carried her cell phone in her bra. [15]

http://www.globalhealingcenter.com/natural-health/10-shocking-facts-health-dangers-Wi-Fi/

Can Wi-Fi Signals Stunt Plant Growth?

A Danish science experiment by a group of 9th-graders has gained worldwide interest and may have us rethinking the proliferation of wireless devices in our homes.

Five girls from Hjallerup Skole, a primary education school in Denmark, began the experiment after noticing that when they slept with their cellphones near their heads overnight, they had trouble focusing the next day, according to Danish News site DR.

The resources weren't available to conduct an experiment around wireless signals affecting brain activity, so instead the girls decided to monitor the growth of plants near Wi-Fi routers - and the results were a bit shocking.

Six trays containing the seeds of a garden cress herb were placed in a room without a Wi-Fi router, and six trays were placed in a different room and next to two Wi-Fi routers which, according to the girls' calculations, emitted about the same type of radiation as an ordinary cellphone, reports DR.

During the 12 days of the experiment, the seeds in the six trays away from the Wi-Fi routers grew normally, while the seeds next to the routers did not. In fact, the project photos show that many of the seeds placed near the routers turned brown and died.

"This has sparked quite a lively debate in Denmark regarding the potential adverse health-effects from mobile phones and Wi-Fi-equipment," Kim Horsevad, biology teacher at Hjallerup Skole told ABC News.

Horsevad said that some of the local debate over the experiment has been over whether the negative effects were due to the cress seeds drying from the heat emitted by the computer/Wi-Fi routers used in the experiment. But she explained that the students kept the cress seeds in both groups sufficiently moist during the whole experiment, and the temperatures were controlled thermostatically.

A similar study was conducted about three years ago in the Netherlands when researchers noticed that some trees in urban areas were showing "bark lumps," according to Popular Science. The experiment, conducted by Wageningen University, involved exposing 20 ash trees to various kinds of radiation for three months. The trees chosen to test tolerance to heavy Wi-Fi signals began to show typical signs of radiation sickness, including a "lead-like shine" on their leaves.

As for the attention the girl's science fair project is getting, Horsevad said neuroscience professor Olle Johanssen with the Karolinska Institute in Sweden has expressed great interest.

"[Johanssen] will probably be repeating the experiment in controlled, professional, scientific environments," said Horsevad. "One would therefore generally be advised to await the results of his experiments before basing any important decisions on the outcome of the girls' experiment."

http://abcnews.go.com/blogs/technology/2013/05/can-Wi-Fi-signals-stunt-plant-growth/

Oh my...what's in Wi-Fi?

Second grader patterns science fair project after Danish experiment

When the school district rolled out the Ipads this year, Aiden Fitchett noticed something new; as he did when seated near the wireless projector any time a teacher used one for a presentation: headaches. Bad ones. Bad enough that the 8-year-old second grader would come home crying from the pain.

His mom, biologist Rachel Fitchett, made a correlation between Aiden's headaches and the circumstances: wireless fidelity waves or Wi-Fi, which has been associated with causing physical effects in a small percentage of the population.

"I knew the health risks associated with Wi-Fi and asked the teacher to relocate him and the headaches stopped," Rachel says.

While that was great, the situation still puzzled Aiden's inquisitive mind. So when Science Fair time rolled around he knew exactly what he wanted to delve into.

"I want to know why I get headaches when I'm around wireless devices but not the wires," Aiden says. "We use a laptop at home, and we have a television set, and it's only around wireless that I get the headaches."

So Aiden set about to answer his question. Patterning his experiment after a Danish experiment by a group of 9th grade students, Aiden and his mom bought some garden cress seeds, growing trays and napkins and got to work.

Aiden placed an equal amount of garden cress seeds atop two napkins, which he placed inside two growing trays. Each was watered until damp. One tray was placed six inches from a wired laptop which was kept on the whole time.

The other tray was placed six inches from a Wi-Fi router in a neighbor's home which was turned on the whole time as well.

Both trays received sunlight from west windows, and both rooms were kept at 69 degrees. The trays were watered daily with the same amount of water.

After six days, the results—similar to those in the Danish experiment—were stunning.

"At first Aiden was excited as the seeds started to grow, but by the second to the last day one of his notations on the Wi-Fi sprouts was 'strange,'" Rachel says.

In the Danish experiment, the cress seeds placed near the Wi-Fi device did not sprout at all. While Aiden's Wi-Fi seeds sprouted, they did not look anything like the robust sprouts growing in the wired room.

The sprouts tasted different as well. Garden cress is a fast-growing herb with a peppery, tangy flavor and smell. The wired seeds tasted strong and peppery—so much so that Aiden had to run for a glass of water. The Wi-Fi seeds had little taste at all. In fact, Aiden said they tasted "like water."
Aiden's conclusion?

"The garden cress are living and growing just like me," he says. "The ones by the Wi-Fi were not healthy and looked crazy. Wireless devices must send things through the air that are not good for my body."

Aiden's mom tends to agree—although in more scientific terms.

"Results clearly showed reduced DNA repair capacity and cell proliferation , hence mimicking the growth of cancerous cells," she says. "The Garden Cress seeds exposed to wireless signals were in fact mutated and unhealthy."

Rachel believes when the wireless signals are intensified by use of multiple devices, so is the negative effect.

"The more that are together, the more concentrated the ill effects are," she says.

Aiden's headaches continued during computer class, so he has since been pulled.

"He's a very bright kid who excels in all subjects, Rachel says. "He doesn't need to get whatever it is they're getting in there."

http://www.tricitytimes-online.com/Articles-News-i-2014-04-02-218015.112113-Oh-mywhats-in-Wi-Fi.html

Checkout 5 Ways Your Wi-Fi Could be Causing You Harm

Wi-Fi is a technology that allows electronic devices to connect to a wireless LAN (WLAN) network, mainly using the 2.4 gigahertz (12 cm) UHF and 5 gigahertz (6 cm) SHF ISM radio bands. A WLAN is usually password protected, but may be open, which allows any device within its range to access the resources of the WLAN network.

The Wi-Fi Alliance defines Wi-Fi as any "wireless local area network" (WLAN) product based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards. However, the term "Wi-Fi" is used in general English as a synonym for "WLAN" since most modern WLANs are based on these standards. "Wi-Fi" is a trademark of the Wi-Fi Alliance. The "Wi-Fi Certified" trademark can only be used by Wi-Fi products that successfully complete Wi-Fi Alliance interoperability certification testing.

Devices which can use Wi-Fi technology include personal computers, video-game consoles, smartphones, digital cameras, tablet computers, digital audio players and modern printers. Wi-Fi compatible devices can connect to the Internet via a WLAN network and a wireless access point. Such an access point (or hotspot) has a range of about 20 meters (66 feet) indoors and a greater range outdoors. Hotspot coverage can be as small as a single room with walls that block radio waves, or as large as many square kilometers achieved by using multiple overlapping access points.

Depiction of a device sending information wirelessly to another device, both connected to the local network, in order to print a document.
Wi-Fi is less secure than wired connections, such as Ethernet, precisely because an intruder does not need a physical connection. Web pages that use TLS are secure, but unencrypted Internet access can easily be detected by intruders. Because of this, Wi-Fi has adopted various encryption technologies. The early encryption WEP proved easy to break. Higher quality protocols (WPA, WPA2) were added later. An optional feature added in 2007, called Wi-Fi Protected Setup (WPS), had a serious flaw that allowed an attacker to recover the router's password. The Wi-Fi Alliance has since updated its test plan and certification program to ensure all newly certified devices resist attacks.

Many are on edge because they can't imagine a world without the internet. But every good thing has it's bad side and it's better to educated yourself to be safe.
Insomnia

When exposed to electromagnetic radiation, you will have more difficulty falling asleep. So when you can't sleep maybe you should just turn off your phone.

Affects cell growth
Sleeping with your phone next to your head can affect your ability to concentrate.
Experiment: One set of plants was grown in a room free of wireless radiation; the other group grew next to two routers that released the same amount of radiation as a cell phone.
Result: The plants closest to the radiation didn't grow.

Reduces brain activity in females

Experiment: A group of 30 healthy volunteers, 15 men and 15 women, were given a simple memory test. First, the entire group was tested without any exposure to Wi-Fi radiation and the results were fine.

Then, they were exposed to 2.4 GHz Wi-Fi from a wireless access point for about 45 minutes.

Result: During that portion of the testing, brain activity was measured and the women had a noticeable change in brain activity and energy levels.

Effects on fertility

Results of experiments on animals show that some specific wireless frequencies can prevent egg implantation. According to the Global Healing Center, during the study, mice exposed 2 hours a day for 45 days had significantly increased oxidative stress levels.

Cardiac stress

Your heart reacts when surrounded by wireless networks including 3G and LTE phones. Your heart rate increases as if you are under stress. You may have not noticed this because you weren't aware of the dangers.

http://nigeriana.org/technology/checkout-5-ways-Wi-Fi-causing-harm/

Wi-Fi Radiation Is Killing Trees, New Study Finds

Studies on the impact of wireless radiation on humans are endlessly inconclusive, but a recent study on the effects of Wi-Fi radiation on trees--yes, trees--indicates that our woody friends may be much more vulnerable than we are. And trees can't even enjoy the benefits of Wi-Fi. It's all very unjust.

The study, conducted by Wageningen University, investigated findings that trees in areas with high Wi-Fi activity (urban areas, especially) were suffering from symptoms that couldn't be tied to typical bacterial or viral causes. The symptoms included bleeding (!), fissures in the bark, the death of parts of leaves, and abnormal growth.

To test the hypothesis that the mystery illness was caused by radiation poisoning, the researchers took 20 ash trees and exposed them to various kinds of radiation for three months. Sure enough, the ash trees exposed to Wi-Fi signals showed telltale signs of radiation sickness, including a "lead-like shine" on their leaves, indicating the oncoming death of those leaves. In the Netherlands, a whopping 70% of urban trees are suffering from radiation poisoning, up from only 10% five years ago--understandable, considering the explosion in Wi-Fi use in the past five years.

Of course, trees in rural or even simply non-urban environments are pretty much unaffected, but theoretically, all deciduous trees in the Western world could be affected.

The researchers are planning several more studies to figure out the precise effects of radiation on plant life. In the meantime, they don't really offer any preliminary solutions, but I'm sure they'd approve of wrapping every urban tree you see in tin foil, root to leaf. *(Note: Wrapping public trees in tin foil may be illegal in your city, state, arrondissement, or prefecture. PopSci cannot be held responsible if you are arrested for such activities.)*

http://www.popsci.com/technology/article/2010-11/wi-fi-radiation-killing-trees

Wi-Fi radiation from laptops, smartphones is damaging your sperm

The latest in a long line of radiation vs. sperm studies has shown, yet again, that you really ought to take your laptop off your lap. The report, published in the Fertility and Sterility journal by some Argentinian scientists, details how semen samples from 29 healthy, potent men suffered significant damage when placed underneath a Wi-Fi-connected laptop.

In a control test — with the sperm kept away from Wi-Fi emissions, but at the same under-laptop temperature — 14% of the sperm died within four hours, and 3% showed DNA damage. When placed underneath a laptop for four hours, 25% of the sperm died and 9% showed DNA damage. The important finding here is that Wi-Fi electromagnetic (EM) radiation damaged the sperm — almost every other study has focused on increased temperature (which also damages sperm, incidentally).

Before you go out and buy a lead jockstrap, though, bear in mind that this is ex vivo — the sperm were outside the testes — and the scientific study does not go as far as to say that that EM radiation actually affects your chance of getting a girl pregnant. Basically, it's entirely possible that the (thin) skin of your testicles is enough to stop Wi-Fi signals from cooking your little men — and furthermore, you constantly produce sperm throughout the day, so unless you preface every conception attempt by having a laptop on your lap for four hours, you should be OK (though I fear I probably just described the standard evening setup for most households…)

Perhaps more importantly, though, this study does show that very weak, low-frequency radiation does have an effect on sperm. We might know the extent of that effect, but this is proof that we at least ought to be careful. If anything, it reaffirms that we shouldn't keep a notebook on our lap for a significant amount of time — and the same should be said of an iPad, Kindle Fire, or your choice of Wi-Fi-enabled gizmo. You probably shouldn't keep Wi-Fi permanently enabled on your smartphone, either.

http://www.extremetech.com/extreme/106977-Wi-Fi-radiation-from-laptops-smartphones-is-damaging-your-sperm

Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation

In recent years, the use of portable computers (laptops, connected to local area networks wirelessly, also known as Wi-Fi) has increased dramatically. Laptops have become indispensable devices in our daily life, offering flexibility and mobility to users. People using Wi-Fi may be exposed to radio signals absorbing some of the transmitted energy in their bodies. Portable computers are commonly used on the lap (1, 2, 3), therefore exposing the genital area to radio frequency electromagnetic waves (RF-EMW) as well as high temperatures (3, 4).

Infertility is a common worldwide condition that affects more than 70 million couples of reproductive age (5). It has been suggested that male fertility has declined during the past several decades (6). Such decline has been attributed to the direct or indirect exposure to certain environmental factors such as RF-EMW (7).

Extremely low frequency magnetic fields can initiate a number of biochemical and physiological alterations in biological systems of different species (8, 9, 10, 11, 12). Many of these effects have been associated with free-radical production (13, 14). Free radicals are causative factors of oxidative damage of cellular structures and molecules such as lipids, proteins, and nucleic acids. Free radicals react with polyunsaturated fatty acids in cell membranes promoting a process called lipid peroxidation. In human spermatozoa the presence of unesterified polyunsaturated fatty acids is causally associated with the induction of reactive oxygen species (ROS) generation and lipid peroxidation (15). Damage may occur at the membrane level, leading to immotility and cell death, or at the DNA level. DNA integrity is essential to normal conception. Sperm DNA fragmentation has been associated with impaired fertilization, poor embryonic development, high rates of miscarriage, and increased incidence of morbidity in the offspring, including childhood cancer (16, 17). It has been proposed that genetic and environmental factors would be involved in the etiology of sperm DNA damage (18).

The RF-EMW from mobile phones may cause DNA damage (19), in addition to decreased motility and viability (20, 21). Increased levels of intracellular ROS (22) would be the cause of these deleterious effects.

Portable computers using Wi-Fi emit RF-EMW and are typically positioned close the male reproductive organs. Their potential negative effects on male germ cells have not been elucidated. To assess this potential association we used an in vitro model incubating human sperm in the presence of an active portable computer connected to the internet by Wi-Fi. Sperm viability, motility, and DNA fragmentation were the main study end points.

To our knowledge, this is the first study to evaluate the direct impact of laptop use on human spermatozoa. Ex vivo exposure of human spermatozoa to a wireless internet-connected laptop decreased motility and induced DNA fragmentation by a nonthermal effect. We speculate that keeping a laptop connected wirelessly to the internet on the lap near the testes may result in decreased male fertility. Further in vitro and in vivo studies are needed to prove this contention.

http://www.fertstert.org/article/S0015-0282(11)02678-1/fulltext

How Does The iPad Influence Your Health: What You Are Not Being Told is This…

Aside from the wide misconception that iPad or other tablets don't emit much radiation, there's growing evidence that links wireless radiation to leukemia, autism, ADHD, cancer, and Alzheimer's.

And according to the World Health Organization, wireless radiation has been classified as a potential carcinogen, being ranged in the same class with DDT, lead, and tailpipe exhaust in terms of ability to cause cancer.

On the other hand, non-ionizing or microwave radiation not only damages the brain, but also the sperm of lab animals. For one thing, tablets are microwave transmitters, which means every few seconds they send out short but strong bursts of pulsed radiation. And this radiation can pose serious risks on children's rapidly-developing nervous and immune systems, resulting in brain maturation and reproductive damage. What this microwave radiation does is disturb DNA, deteriorate the brain's protecting barrier, and discharge highly reactive and damaging free radicals. Sadly, the bone marrow of a child's head absorbs 10 times more radiation than an adult, whereas those of infants and toddlers even more.

According to research, adults who have consistently used wireless gadgets for at least ten years are at a greater risk of brain cancer (glioma and acoustic neuroma), salivary gland cancer, and even rare eye cancers on that side of the head where the cell phone was most held (Davis, 2010). Moreover, a number of men diagnosed with testicular cancer had the cancer appear in the testicle closest to the pant pocket where they usually kept their cell phone (Davis, 2013).

Ways to reduce your EMF exposure when using an iPad or other Tablets:

- Try to use your iPad tablet on airplane mode and Wi-Fi to Off as this will stop the connection radiation.
- Avoid using your iPad on your lap. Hold it further away from the body as every inch decreases the power of radiation exposure to a greater extent.
- Reduce the time spent using wireless devices.

http://chere1.com/ipad-influence-health-not-told/

STEALTH CANADA—deep-sixing the science on wireless radiation

Health Canada is inspiring activism in even the most passive Canadians (especially those harmed by wireless microwave radiation from Wi-Fi, cell phones etc)—motivating them to protect their own health, ensure their own survival, stand up for their rights, and tap into their compassion and humanity—since Health Canada seems incapable of doing any of these things for them.

Teachers, too, are being challenged to become empowered. If they dare to test the levels of radiation coming from Wi-Fi routers in their school, to protect their own health as well as the health of the schoolchildren, or if they turn the router off when not in use, they can lose their job. One teacher in BC—Maria Plant—who has been teaching for 30 years, was forced to retire because the Wi-Fi in her school became intolerable, and she now has such severe electro-sensitivity, as a result, that she can no longer lead a normal life. "It's been emotionally and physically devastating to slowly succumb to this disorder of EHS [electromagnetic hypersensitivity]," she says, "as it forced me to give up the two loves of my life: teaching and physical outdoor activity, because my inner ear and balance are most severely affected by radiofrequency signals."

Yet fighting for your rights can be hard to do when you're ill, and Plant says that EHS has resulted in depression and a crippling sense of defeat. "Sometimes, it feels as if it would be easier to just quit living," she says. "My personal life and relationships have fallen apart and I can no longer engage in social activism or contribute as a teacher and Union Rep. It has torn me from my close-knit community and the life-long friends who were my source of joy and support."

Paying for alternative medicines, therapies and specialists can be tough for a single adult, but the financial burden of selling her home and moving several times, working part-time for five years, and losing her last five years of pension contributions has been overwhelming for Plant.

Worst of all, she says, is the ridicule and humiliation from uninformed doctors, specialists, colleagues and parent groups, friends, associates and family members who mocked her symptoms. "They did not believe me when I told them that wireless radiation was the cause of my illness, or the cause of the anxiety and the flu-like symptoms (vomiting, dizziness, head pain, eye pain etc.) that my vulnerable seven-year-old students reported while working near the Wi-Fi routers at school."

If adults can be so severely affected, imagine what these high levels of non-stop microwave radiation are doing to young schoolchildren. One of them—12-year-old Tyler from Victoria, BC (pictured below)—can no longer go to school as the Wi-Fi radiation causes severe headaches, vomiting, insomnia, night terrors and fatigue. Three school districts in BC have refused to accommodate him by turning off the Wi-Fi routers or hard-wiring the computers—which could so easily be done. Instead, Tyler is being denied his right to an education, not to mention being able to socialize with his friends, build important life skills such as communication and team-building, take part in sports, build his self-esteem or do any of the things that teenagers normally do as part of their healthy development.

What kind of government refuses to allow children such as Tyler to go to school without being harmed—and knowingly harms all the other children who may not yet be feeling the radiation's effects? Why should any child—or adult—be denied this fundamental right, and instead be excluded and forced to function in isolation as if *they* were the problem rather than the toxic environment?

http://olgasheean.com/stealth-canada-deep-sixing-the-science-on-wireless-radiation/

Effects of 2.4 GHz radiofrequency radiation emitted from Wi-Fi equipment on microRNA expression in brain tissue.

Abstract

PURPOSE:
MicroRNAs (miRNA) play a paramount role in growth, differentiation, proliferation and cell death by suppressing one or more target genes. However, their interaction with radiofrequencies is still unknown. The aim of this study was to investigate the long-term effects of radiofrequency radiation emitted from a Wireless Fidelity (Wi-Fi) system on some of the miRNA in brain tissue.

MATERIALS AND METHODS:
The study was carried out on 16 Wistar Albino adult male rats by dividing them into two groups such as sham (n = 8) and exposure (n = 8). Rats in the exposure group were exposed to 2.4 GHz radiofrequency (RF) radiation for 24 hours a day for 12 months (one year). The same procedure was applied to the rats in the sham group except the Wi-Fi system was turned off. Immediately after the last exposure, rats were sacrificed and their brains were removed. miR-9-5p, miR-29a-3p, miR-106b-5p, miR-107, miR-125a-3p in brain were investigated in detail.

RESULTS:
The results revealed that long-term exposure of 2.4 GHz Wi-Fi radiation can alter expression of some of the miRNAs such as miR-106b-5p (adj p* = 0.010) and miR-107 (adj p* = 0.005). We observed that mir 107 expression is 3.3 times and miR- 106b-5p expression is 3.65 times lower in the exposure group than in the control group. However, miR-9-5p, miR-29a-3p and miR-125a-3p levels in brain were not altered.

CONCLUSION:
Long-term exposure of 2.4 GHz RF may lead to adverse effects such as neurodegenerative diseases originated from the alteration of some miRNA expression and more studies should be devoted to the effects of RF radiation on miRNA expression levels.

https://www.ncbi.nlm.nih.gov/pubmed/25775055?dopt=Abstract

Schools

Inviting Discussion about Safer Tech Use in Schools – Katie Singer

2/7/2017

In one generation, use of electronic technologies has exploded, creating dramatic environmental and cultural changes, including in classrooms. As we read, write, research, meet and express ourselves, electronics offer extraordinary possibilities. Meanwhile, to develop self-respect, empathy, humor, awareness of themselves and others and social skills, children still depend on human contact in a real (not virtual) world.

Electronics are tools, not substitutes for human teachers or peers. Every community still needs children who are familiar with the real world around them; who learn (from other people) to think critically and ethically; who are well versed in biology, chemistry, physics, literature, music and art. Students need to create and imagine from their own minds, not to follow a computer programmer's choices or direction. For healthy development, children need time without electronics, in nature, socializing with each other and contributing to their communities. Youth need purpose. They need to participate in person-to-person conversation about real world problems and solutions.

Prudent integration of technology use in classrooms requires that school board members work with administrators, teachers and parents to clarify educational priorities, identify problems and determine best practices. Basing purchasing decisions solely on an IT director's recommendations may lead to technology dominating a classroom–rather than serving as a tool that enhances learning.

Indeed, most schools implement wide use of technology even though its effects (including among children) are largely unknown. Because no federal agency regulates children's use of electronics, schools must create their own guidelines.

This paper aims to encourage discussion about safer, more responsible use of technology in educational settings. It presents critical issues and options for consideration:

Screen-time contact is no substitute for in-person relating. For healthy neurological, social and emotional development, infants, children and teenagers need to relate with adults, each other and the natural world. Because technology use can contribute to aggressive behavior, depression and neurological problems including autism, ADHD and addiction, users need to learn limits.
Common educational software tracks students' preferences, interests, social contacts and locations. Software manufacturers collect this data from each student and can use it for lifelong marketing tools. Students and parents need protection from such tracking. Further, wireless technologies increase vulnerability to hacking. Schools therefore need wired Internet access.
Wireless devices and infrastructure emit man-made electromagnetic radiation (EMR). Scientific studies have shown the high likelihood that EMR exposure causes brain and heart cancer, DNA damage, neurological harm, general malaise, medical implant malfunctioning and more. To reduce students' EMR exposure, schools need to provide wired Internet access.
During a power outage, schools without a corded telephone on a copper legacy landline may be unable to reach first responders.
Because current federal law regarding telecommunications prohibits municipalities from determining cellular antenna placement based on health or environmental concerns, parents, teachers and children

may have little control over their EMR exposure. School communities need to exercise their rights to reduce their exposure within existing legal parameters.
In the event of security breeches or health damages caused by school-issued computers, who is liable? To what extent can a school board ensure that students' data and health are safe? Before authorizing tech purchases, do school boards need to study whether computer use improves learning and/or harms development?
To begin discussion, school administrators, board members, teachers, parents and students might adopt a routine of asking questions such as:
* What are the long-term consequences of using electronic devices–to health (including brain development), social skills and community?
* Could we do this activity without an electronic device?
* Could we balance screen-time with time in nature and with others?
* How can we minimize exposure to man-made electromagnetic radiation?
* What steps might prevent tech addiction?
* What steps minimize hacking risks?
* Online, how/can we maintain privacy? Why/does privacy matter?
* Until what age (or the achievement of what skills) should children not learn computer coding or programming?
* Given federal and municipal mandates, what limits can schools and households reasonably impose to support safer tech use?

Screen-time, addiction and ADHD
The situation: In the 1970s, four-year-olds who could delay eating a marshmallow for fifteen minutes (by singing to themselves, making up a game or napping) became more confident and skilled adults, more able to cope with stress.[1] Now, temptations are electrified. Microwaves (frequencies required for mobile devices to operate) increase activity of brain endorphins or endogenous opioids, the biological base of addiction to opium, alcohol and morphine.[2]

Like all electronics users, children need skills in delaying gratification (i.e. waiting to check messages) and limiting screen time.

Dr. Nicholas Kardaras, author of Glow Kids: How Screen Addiction is Hijacking Our Kids–and How to Break the Trance, has found treating heroin and crystal meth addicts easier than "lost-in-the-matrix video gamers or Facebook-dependent social media addicts." Dr. Kardaras reports that one out of three children now uses a tablet or smartphone before they can talk.[3]

Integrative child psychiatrist Dr. Victoria Dunckley, MD, author of Reset Your Child's Brain, reports that screen time overloads the sensory system, fractures attention and depletes mental reserves. It desensitizes the brain's reward system, can increase suicide risk and reduce physical activity levels.[4] Even 30 minutes of computer use can disturb sleep; and interactive screen-time (playing video games and/or manipulating a screen with a keyboard, mouse or touch) is more detrimental to brain development than non-interactive, passive TV watching.[5]

Pediatric occupational therapist Chris Rowan explains that technology use's
* sedentary nature is causally related to obesity, diabetes, developmental delay, illiteracy and learning difficulties.[6],[7],[8],[9]
* isolating factor can escalate mental illnesses including ADHD, autism and depression and create difficulties in self-regulation.[10],[11]

* overstimulation factors into ADHD, aggression, sleep disturbance and chronic stress.[12],[13],[14],[15]

Screen-time based sedentary behavior can contribute to childhood and adolescent depression.[16]

Using a portable screen device also impacts sleep.[17]

"Distracted" walking and driving injuries and fatalities are on the rise. A Mayo Clinic study finds that text messaging appears to produce a unique brainwave form that can cause epileptic and nonepileptic seizures. This "texting rhythm" was also found in iPad users.[18]

Options:
* Minimize use of electronic devices until reading, writing and math skills are established on paper.
* Do not offer computer time as a reward, a babysitter or pacifier.
* Ban cell phones in classrooms. Some schools ban them during hallway and lunch breaks, confiscate the phone for 1-30 days with the first violation, and, with the second violation, until the school year ends. Bans require school board support and sufficient warning to parents and students. At Monte del Sol (charter high school) in Santa Fe, New Mexico, Principal Dr. Robert Jessen reports that with the ban, students face teachers during class and talk to each other during lunch breaks. A study from the Univ. of Texas and Louisiana State Univ. found that test scores rose by up to 6% in schools with strict cell phone bans.[19]
* Teach parents and students to identify symptoms of excessive screen time: aggressive behavior, disrupted academic or social performance. If use becomes problematic, consider Dr. Dunckley's three-week electronic fast to "detox" and determine the student's healthy tech threshold.[20]
* Encourage movement, hiking, sports, chess, book reading, hand-writing, theatrical productions, painting, pottery-making, conflict resolution skills, research by in-person interviews, playing music, learning a second language, composting kitchen scraps and growing and preparing food.
* According Jocelyn Glei, author of Unsubscribe: How to Kill Email Anxiety, Avoid Distraction and Get Real Work Done, on average, people check email eleven times per hour. Such frequency decreases productivity. To help children develop healthy work habits, teach them to check email in batches–say two or three times per day.
* Provide Wi-Fi-free and tech-free areas for students and staff.
* Encourage teachers and parents to model self-awareness and self-regulation around screen-time limits.

Activities:
* Create "Personal Tech Contracts" and ongoing discussions about responsible tech use.[21],[22]
* Establish "crews" that meet daily over years with the same students and teachers to help children build real relationships.
* Encourage discussion about how tech influences our relationships.
* Recognize the danger of texting while driving. Encourage students and families to pledge to stop texting and driving. Texting takes your eyes off the road for an average of five seconds. At 55 mph, that's like driving the length of a football field–completely blind. Car crashes caused by texting and driving kill an average of eleven teens each day and injure 330,000 people every year.[23]
* Invite discussion: What is addiction? What are signs of tech addiction? What do camps in China do to remedy tech addiction?[24] What steps prevent tech addiction? What screen-time limits are healthy for you?
* Read and discuss Jerry Mander's Four Arguments for the Elimination of Television, Quill, 1978.

* View and discuss "Screenagers," Delaney Ruston, MD's documentary about teen cell phone use. www.screenagersmovie.com

Security and Privacy
The situation: School-issued computers likely collect info about students' Social Security numbers, food preferences, friends' names, grades and discipline records. School-issued computers may contain geo-trackers that provide students' exact locations. Without regulations, manufacturers (i.e. Apple and Pearson) who sell computers and software to schools may collect students' info to create "data-mined profiles" for lifetime marketing tools.

Further, according to applied physicist Dr. Ronald M. Powell, "The second you go wireless, you expose yourself to greater risk of interception. Fiber optic systems (fios) will always be able to carry data faster and more securely than any wireless system." Staff and student data can be hacked.[25],[26] Thirteen percent of educational organizations have been hacked–more than three times the rate of ransomware (payment for releasing data taken "hostage") found in healthcare and more than that of the financial sector.[27]

Computer-based assessments of students and Smarter Balanced Test Scores have led to unfair test administration, security and privacy issues related to test data, violation of students' rights, delivery of tests on faulty networks and technology, and long-term motivational problems that likely result from misdiagnosing students with unfit assessments.[28],[29]

Options:
* Eliminate wireless service and devices. Opt for fiber optics (fios) and wired phones, computers, mice and printers. For affordable fiber connections, see Harvard's Berkman Center for Internet and Society's Maximizing K-12 Fiber Connectivity Through E-Rate.[30]
* Teach users not to use physical addresses or birthdates in email addresses or passwords, not to reply to email from strangers, and to open an attachment only when you know the sender and expect the attachment.
* Teach staff and students that each device (i.e. a tablet, chromebook, or smartphone) has its own security practice.
* Establish email security protocols, monitor key third party vendors, track vendors' security ratings and avoid file sharing.

Activities
* Interview people who've been hacked. What happened? What advice do they have to prevent hacking?

Invite discussion: Do you prefer mobility (which risks hacking) or wired-only communications (which decreases hacking risks)?

2a. Critical thinking and tech design

The situation: According to Tristan Harris, former Design Ethicist at Google, tech product designers limit and even control users' thinking by creating a menu of choices. For example, in response to the question, "Where can we go to talk?" a server might offer a menu of bars–and not include nearby parks or diners.[31]

Activities:
* As they conduct research for school reports, encourage students to ask, What are the menu providers' goals? What's not on the menu? Does the menu serve my real needs or distract me? Does the server provide websites with opinions or well-referenced reports?
* Read and discuss Dr. Kenneth J. Saltman's Scripted Bodies: Corporate Power, Smart Technologies and the Undoing of Public Education, Routledge, 2017.

EMR exposure
The situation: In living creatures, every cell functions by electro-chemical signals.[32] Our physiological functions (i.e. sleep, digestion, decision-making and locating home) ultimately depend on cues from the Earth's electromagnetic fields, the solar wind and other natural sources.

Electronics (including cell phones, tablets, compact fluorescent bulbs, cordless phones) and infrastructure (such as cellular antennas; Wi-Fi routers; "smart" digital, wireless utility meters; powerlines and transformers) emit man-made electromagnetic radiation (EMR). In May, 2011, The World Health Organization classified EMR as a 2B carcinogen.[33] In May, 2016, NIH's National Toxicology Program found that 2G cell phone radiation causes brain and heart tumors and DNA damage.[34] A Feb., 2016 report published by the journal Neuro-Oncology and funded by the American Brain Tumor Association finds that malignant brain tumors are the most common cause of cancer-related deaths in adolescents and young adults aged 15-39, and the most common cancer occurring among 15-19 year olds.[35] (Leukemia used to be the leading cancer among children, but now it is #2, behind brain cancer, signaling an environmental change.) In September, 2016, the American Academy of Pediatrics issued recommendations to reduce exposure to cell phones.[36]

Because children's skulls are thinner and their brains contain more fluid than adult skulls and brains, children absorb proportionately more radiation than adults. The effects of EMR exposure on a child's development may have lifetime impacts,[37] including on their fertility.[38]

Neither wireless devices nor the infrastructure that they require have been proven safe for children, pregnant women, people with medical implants, the general population or wildlife.

Options:
* Get informed about the health and environmental effects of EMR-exposure. Studies are posted at www.saferemr.com (from UC/Berkeley's School of Public Health) and www.bioinitiative.org.
* Recognize that every reduction in EMR-exposure is worthwhile.
* Encourage students and staff to keep mobile devices off when not in use. To ensure that a device is off, test its EMR emissions. Www.magneticsciences.com/ rents meters for reasonable fees.
* Choose wired connections–for phones, web access, mice, printers.[39]
* For affordable fiber connections, see Harvard's Berkman Center's Maximizing K-12 Fiber Connectivity Through E-Rate.[40]
* Avoid or correct equipment that defaults to wireless.
* Teach school nurses, teachers, parents and students to identify common symptoms of EMR exposure, including bloody noses, sleep disturbances, headaches, fatigue, rashes, migraines, dizziness, nausea and aggressive behavior.[41],[42]
* Recognize the short and long-term effects of near, whole body, second-hand, combined and cumulative EMR exposures.[43]
* See "Schools, Unions and PTA Actions," an int'l list of schools that have removed Wi-Fi, posted by the Environmental Health Trust.[44]

* Create Wi-Fi and tech-free zones for children and staff.

Activities:
* Learn which diseases correlate with different kinds of EMR exposure. http://www.bioinitiative.org/rf-color-charts/
* At parent-teacher meetings, encourage family time without electronics and keeping Wi-Fi off for at least 12 hours each night. Read "Calming Behavior in Children with Autism and ADHD."[45]
* Stage contests between classrooms and schools to reduce EMR emissions.

3a. Cell phones and health

The situation in the mid-1990s, to determine cell phone safety, the FCC took the temperature of a 220-pound mannequin's head before and after six minutes of cell phone use. Because this mannequin's temperature did not change by two degrees Celsius, the FCC determined that mobiles are safe.[46] In other words, to determine safety, the FCC considered only the immediate, thermal effects of cell phone use.

The FCC has not tested non-thermal effects of EMR exposure, including for children's or pregnant women's cell phone use, nor for combined, chronic or cumulative exposures.

In 2015, Dr. Om Gandhi, Professor of Electrical Engineering at the University of Utah, co-chair of the Institute of Electrical and Electronics Engineers' (IEEE's) Subcommittee on RF Safety Standards (1988-97), wrote: "it is very hard to understand why" FCC's safety guidelines only consider the head of a mannequin whose size is in the 90th percentile of US military recruits–and do not consider children's head size when creating safety guidelines.[47]

Cell phone radiation contributes to brain and heart tumors and damages DNA.[48] It weakens the blood-brain barrier.[49]

In utero EMR exposure results in an 85% greater risk for behavioral problems by the time children reach school age. [50]

Options:
* Keep devices in airplane mode with Wi-Fi and Bluetooth off, especially in class and around others.
* Do not keep a phone in a bra, pant pockets or shirt pocket. Make the bra a no-phone zone.
* To decrease RF exposure, download images and videos only via a wired (fiber optic, cable or DSL) connection.
* Maintain landlines and corded telephones as long as possible and/or until fiber optics are in place.
* Mitigating EMR emitted by a cell phone or voice over Internet protocol (VOIP) is unique to each situation. Could local electrical engineers help students to measure and reduce emissions?
* Create protected areas to prevent second-hand EMR exposure (received by people and wildlife near cell towers, routers, "smart" meters and/or people using mobile devices).

Activities:
* View "Cell Phones Cause Cancer."[51]
* View "Save the Girls" [52] and "Save the Males."[53]
* View Dr. Devra Davis' talk at the University of Melbourne.[54]

* Read your cell phone manufacturer's warning. For one week, abide by it–i.e. keep your phone at least 7/8" from your head.
* Make your own flier with warnings and solutions about cell phone use.
* Invite discussion: Should cell phones have warning labels at the point of sale, as Berkeley, California requires?[55] How/could pregnant women limit their cell phone use? For ideas see www.babysafeproject.org.

3b. Wi-Fi and health

The situation: No medical organization has deemed that Wi-Fi is safe. No pre-market safety testing (including by FDA or EPA) was conducted on Wi-Fi. Wi-Fi presents whole body EMR-exposure to users and non-users. Faculty and students who work or study near routers may receive more intense exposure.

British biologist Dr. Andrew Goldsworthy, retired lecturer from Imperial College, explains: "Just after birth, a child's brain goes through an intense period of becoming aware of new sensory input. He or she recognizes his or her mother's face, her expressions, and eventually, other people and their relationships. During this process, the neurons in the brain make countless new connections, and the brain stores what the child learns. Connections that are rarely used are pruned. This pruning process is completed by the time of sexual maturation.[56]

"If the child is exposed to radiofrequency fields during this pruning process, the production of too many and often spurious signals will generate frequent random connections. These will not be pruned, even though they may not make sense. Because the pruning process in children exposed to RF fields may be more random, these children–who may have more brain cells than the rest of us–may lack the mindset for normal patterns of social interaction. This may then contribute to various autistic behaviors.

"Like mobile phone signals, Wi-Fi signals can also cause cell membranes to leak and calcium ions to flow through them in a relatively uncontrolled manner.[57] In the classroom, this may result in children's brains losing the ability to concentrate.

"Further, electromagnetic radiation (such as that emitted by Wi-Fi, cell phones, cell towers and 'smart' meters) may affect the body like light does at night–and inhibit melatonin production. Melatonin is a sleep hormone and a powerful antioxidant. It can reverse oxidative stress that results from radiation exposure.[58]

"While scientists explore further how EMR exposure reduces melatonin production and study whether EMR-induced oxidative stress contributes to autism–along with many other questions–we ought to first do no harm to our children. Wi-Fi should therefore be considered an impediment to learning, rather than an aid. Wi-Fi may be particularly hazardous to pregnant teachers, since exposing the brain of a fetus or a very young child to EMR may prevent normal brain development."[59]

In a 2013 letter to the Los Angeles Unified School District, Dr. Martha Herbert, MD, PhD, pediatric neurologist at Harvard Medical School wrote: "EMF/RFR from Wi-Fi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function." She urged the LAUSD to "opt for wired technologies."[60]

Dr. Hugh Taylor, MD, head of Yale Medical School's Ob/Gyn Department, recommends that pregnant women (including pregnant teachers, students and parents) "avoid prolonged or direct exposure to Wi-Fi routers." (www.babysafeproject.org.)

A recent study from the California Department of Health found that three percent of Californians (770,000 people) experience radio-frequency sickness (headaches, rapid heartbeats, memory problems, insomnia, nausea, fatigue, tinnitus) with EMR exposure.

Www.ehtrust.org has compiled an international list of schools and countries that have banned Wi-Fi.[61]

Options:
* Read applied physicist Dr. Ronald M. Powell's report on school Wi-Fi.[62]
* Read Dr. Joel Moskowitz's report on Wi-Fi in schools.[63]
* Install wired connections. Until Internet access is wired, every router needs an on-off switch. When not in use, keep routers off.
* Encourage students and teachers to keep routers off at night.

Activities:
* Per classroom, have students make signs to encourage keeping Wi-Fi off when not in use.
* Research policies about Wi-Fi in schools and libraries in France, Israel and other countries.[64]
* Invite discussion: What do we win and what do we lose with mobility? With wired connections? Which is better for the short-term: mobility or wired connections? Which is better for the long-term? How/can we orient ourselves for the long-term?

3c. Cellular antennas and health

The situation: Studies find that people living near cellular antennas experience fatigue, headache, sleep disruption, irritability, depression, memory loss, dizziness, nausea, increased risk of cancer, tremors, loss of appetite, rashes, visual disruptions and overall discomfort.[65]

People who live within 350 meters (about 1000 feet) of a cellular antenna for more than a decade experience a four-fold increase in cancer rates. Among women, the increase is tenfold.[66],[67]

People who live within 200 to 500 feet of an antenna report genetic, growth and reproductive effects; increases in the blood-brain barrier's permeability; behavioral, molecular, cellular and metabolic effects; and an increased risk of cancer.[68]

Many schools already have cellular antennas on campus. [69] Do staff and parents deserve to know about antenna sitings? Should staff and students be able to work and study in a building without cellular antennas?

5G will support the Internet of Things (IoT, machine-to-machine communication) at speeds 100-fold faster than 4G.[70] 5G will operate with millimeter wave signals that have been tested only minimally for health and environmental effects. (Skin and eyes may have most significant effects.)[71] What choices will schools have regarding 5G antenna placement?

Options:

* Provide easy access to a map of routers, smart meters, cellular antennas, wireless chargers, electrical/mechanical rooms, solar power inverters and other electrical hot spots on school property.
* Learn diseases associated with exposure to hot spots and transmitters.[72]
* If EMR levels on campus are high, allow students and staff to transfer to a school with lower levels.
* Explore legal options for preventing cellular antennas on campus.
* Read applied physicist Dr. Ronald M. Powell's "Cell Towers and Health."[73]

3d. EMR exposure on school vehicles

The situation: In a moving vehicle, every time a mobile device connects to a new cell tower (approximately every mile), the device goes to maximum power. Much of the EMR gets trapped within the vehicle (a metal box).

Wi-Fi on school buses traps yet more EMR.

Computers used by vehicles including hybrid and electric cars can emit especially high electromagnetic fields.

Options:
* Keep mobile devices off in school vehicles.
* Do not allow Wi-Fi on school buses.
* Test vehicles' EMR emissions. Do not allow children, pregnant women and people with implants to sit in seats with high levels.

3e. Electronic interference with medical implants

The situation: According to NIH, in year 2000, 8-10% of the American population had a medical implant (i.e. an insulin pump, cochlear implant, pacemaker or neurostimulator).[74] Nearness to a metal detector, refrigerator, air conditioner, mobile phone or tablet, Wi-Fi router, wireless recharger, an electric or hybrid car can cause a medical implant to malfunction or shut off.[75] For example, walking through a library's metal detector can shut off a person's deep brain stimulator. The person would have a few seconds to reset–or they'd shake so badly that they could not reset the implant without help.

Option:
* Post signs to alert and protect people with implants, i.e.:

WARNING electromagnetic radiation (EMR) in this area could cause a medical implant to malfunction or shut off

Activities:
* View 2009 talk by Dr. Gary Olhoeft (geophysicist and electrical engineer) about electronic interference with his deep brain stimulator. [76]
* Read Katie Singer's 2015 talk, "Aiming to First Do No Harm: The Education of an Electronics' User," about the FCC's definition of "harmful interference" and the reality of living with an implant. [77]

3f. Grounding and wiring errors and "chopped" current

The situation: Buildings that have no wireless service may still generate dangerous magnetic fields and/or stray voltage from grounding and/or wiring errors. If clean, man-made electricity (which may not exist, inpractice) is a smooth AC wave at 50 or 60 Hz, high frequencies or pulses on the wires can "chop" current, disrupt power quality and harm health. "Chopped" current is also called harmonics or "dirty" power.

"Smart" utility meters, wiring errors and any device with a power supply (including a wired computer) or an electronic ballast (including compact fluorescent bulbs) can chop current, disrupt power quality and harm health. Sitting in or near a room with wired computers or even near one computer can thereby contribute to a child's EMR exposure.

Options:
* To correct grounding and wiring errors, refer to Karl Riley's Tracing EMFs in Building Wiring and Grounding, 2nd ed. www.magneticsciences.com
* To locate and correct electric, magnetic and RF fields and "dirty" power on school property, hire independent engineers to conduct an annual survey. Follow up corrections with another survey. Encourage students to participate in the surveys and the corrections. Shut down rooms with dangerous levels of exposure. Note that finding a reliable surveyor may not be easy. (See applied physicist Dr. Ronald M. Powell's review of a survey of RF levels in Montgomery County, Maryland Schools.[78])
* Read the American Medical Association's 2016 paper about LEDs' human and environmental effects.[79] Do not use mercury vapor lights, compact fluorescents or LEDs with electronic ballasts. These produce "dirty" power that radiates out from electrical wires. Prefer incandescent bulbs. (They do not generate chopped current.)

Activities:
* Read "Is Dirty Electricity Making You Sick?" by Michael Segell, Prevention, Nov. 3, 2011.
* Learn to install battery and/or solar-powered DC lights.
* Invite discussion: Should wiring and grounding errors be determined and cleaned up before deploying new technologies?

Emergency preparedness
The situation: In the event of a power outage, only hard-wired, corded telephones on copper legacy landlines will work. Cell phones and voice over Internet protocols (VOIPs, i.e. Magic Jack and Skype) require electricity and therefore will not work in a power outage.

Note: the FCC and 13 states have passed legislation that will "sunset" copper legacy landlines by 2020. Only cell phones and VOIPs will be available.

Options:
* Maintain copper legacy landlines and corded landline telephones as long as possible.
* Maintain industrial strength battery backup for phone systems that require electricity.

4a. Lithium ion batteries

The situation: Lithium ion batteries are used in laptops, smart phones, e-cigarettes, "smart" meters and many other electronic devices. They are light and store lots of energy per weight. They can also explode; they are also flammable. [80]

Option:
* In the event of an explosion or fire caused by a device with a lithium ion battery, keep a fire extinguisher nearby.

Rules, regulations and liability re cell towers and phones
The situation: Section 704 of the 1996 Telecommunications Act prohibits municipalities from denying a permit to install a cellular antenna based on health or environmental effects of exposure to radiofrequency emissions. Underwriters like Lloyds of London will not insure for health or property damages caused by wireless radiation.[81]

Activities:
* Teach staff and students to measure electric, magnetic and radiofrequency fields and "dirty" power emitted by their own devices. Www.magneticsciences.com rents meters for reasonable fees.
* When introducing students to an electronic device, encourage them to read and abide by the manufacturer's warnings in the product's manual.
* View "Broadcast Blues," a documentary about the Golden, Colorado area's health and legal battles in the late 90s around radio and TV broadcasting antennas placed on Lookout Mountain.[82]
* View "Blood in the Mobile," a Danish documentary about coltan, a mineral mined primarily in Congo that holds charge in every mobile device. More people have been murdered over coltan than were murdered in any other event since WWII.[83]
* View "We the People 2.0," Matthew Schmid's documentary about municipalities like Pittsburgh enacting ordinances that effectively prevent fracking or toxic sludge in their areas.[84] Could such a community rights ordinance work with cellular antenna placement?
* Invite discussion: Given that federal and manufacturers' guidelines regarding EMR emissions do not recognize non-thermal, biological harm, and some people want to reduce exposure, what regulations can individuals, households, schools and/or businesses reasonably create? What regulations should they create? Could you create model guidelines for a household or school?

Endnotes, Sources, Original Article: http://www.electronicsilentspring.com/safer-schools/

Message to Schools and Colleges about Wireless Devices and Health

March 11, 2017
Ronald M. Powell, Ph.D

If wireless devices, such as Wi-Fi, are used in your schools and colleges, then the health of your students, your faculty, and your staff can be at risk. This is a difficult problem but an addressable one if you act.

Background: Wireless devices transmit information using radiofrequency/microwave radiation. The international biomedical research community has been studying the biological impact of such radiation for decades, but more intensely in recent years. Thousands of peer-reviewed studies published in biomedical research journals have contributed to our understanding of this impact. So many serious biological effects have been found that immediate responsive action is warranted. Further, these biological effects are occurring at levels of radiation far lower than earlier understood. Simply stated, a worldwide health crisis is emerging and is becoming a hallmark of the 21st Century. The international biomedical research community is trying to warn us; but we, in the USA, are not yet listening. I hope this message will help to change that.

As a scientist, I urge you to look into the **health impact of the radiofrequency/microwave radiation** produced by wireless devices. Examples of wireless devices of concern in our environment are Wi-Fi in all of its forms; cell phones and cell towers (especially those located on school grounds); cordless phones; wireless computers, whether desktop, laptop, or tablet versions; wireless baby monitors; wireless smart electricity meters; emerging wireless smart appliances; and microwave ovens (because they always leak radiation).

This crisis is the consequence of many factors. Here are some of them:

- All living things are bioelectrical in nature. That is why electrocardiograms and electroencephalograms work. They, of course, measure the tiny electrical signals that operate the heart and the brain. The critical tasks performed by these tiny electrical signals, and so many other electrical signals in all living things, can be disrupted by man-made radiofrequency/microwave radiation.
- The levels of man-made radiofrequency/microwave radiation in our environment are increasing exponentially and already exceed, by many orders of magnitude, the levels at which all life on Earth evolved. Simply stated, we are drowning in a rising sea of radiofrequency/microwave radiation.
- The invisible nature of radiofrequency/microwave radiation leaves the public and the decision-makers unaware of the rising levels of radiation around them.
- The genuine usefulness of wireless devices promotes denial of the risks.
- The intense advertising, the economic power, and the political power of profitable wireless industries enable them to dominate the public dialogue and to hold sway over government regulators and legislators.
- Current Federal standards for limiting the exposure of the public to radiofrequency/microwave radiation are outdated and overly permissive. Those standards are based on thermal heating alone. In effect, the Government claims that if you are not cooked too much by the radiation, then you are fine. Those Federal standards ignore the many biological effects that occur at much lower levels of radiation, leaving the public unprotected.

- Federal and state governments are advocating unlimited expansion of wireless technology, and are even co-funding such expansion and mandating the acceptance of wireless technology by the public. Such actions reflect a widespread lack of understanding of, or willful blindness to, the underlying science and its consequences for public health.
- Some of the more serious consequences of exposure to radiofrequency/microwave radiation (such as DNA damage, cancer, and infertility) are especially nefarious because they give no early warning signs.
-
- Other consequences of exposure do give early warning signs (such as sleep disruption, headaches, fatigue, ringing in the ears, memory loss, dizziness, heart arrhythmia, and many others); but those signs are too often dismissed because they can have other causes as well, complicating identification of the true cause.
- The absence of routine training of physicians in the biological effects of radiofrequency/microwave radiation makes it difficult for physicians to identify the causes and to provide responsive guidance.
- Even aware individuals cannot control their exposure in any environment shared with others, because the radiation around them, much like second-hand smoke, is forced on them by unaware individuals. Only governments can fully solve this problem, but they are currently part of the problem. For now the public will have to protect itself, and that will require public education and action.

Fortunately, many of the services that wireless devices offer can be realized with much safer wired devices. The wired devices achieve connectivity with fiber-optic, coaxial, or Ethernet cables. The wired devices are faster, more reliable, and more cyber secure. They are, however, less mobile, often less convenient, and somewhat more expensive to install. But those drawbacks pale in comparison to the benefits of good health.

Simply stated, schools and colleges can protect their students, staff, and faculty from the health risks posed by wireless devices, including Wi-Fi, by converting to safe wired connectivity. If your institution lacks the resources to convert now, do consider shutting down your wireless devices anyway and converting as soon as you can. You can advance learning without leaving a trail of illness behind you, some of which can be lifelong.

Regards,
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My background
I am a retired U.S. Government scientist (Ph.D., Applied Physics, Harvard University, 1975). During my Government career, I worked for the Executive Office of the President, the National Science Foundation, and the National Institute of Standards and Technology. For those organizations, respectively, I addressed Federal research and development program evaluation, energy policy research, and measurement development in support of the electronics and electrical-equipment

industries and the biomedical research community. I currently interact with other scientists and with physicians around the world on the impact of the environment – including the radiofrequency/microwave environment – on human health.

https://www.scribd.com/document/289778053/Message-to-Schools-and-Colleges-about-Wireless-Devices-and-Health

School officials may be personally liable for exposing children to wireless radiation

School districts, school boards and school medical health officers in Canada have been notified that Lloyd's of London has now excluded any liability coverage for injuries, "directly or indirectly arising out of, resulting from or contributed to by electromagnetic fields, electromagnetic radiation, electromagnetism, radio waves or noise." This includes the radio frequency radiation emitting from Wi-Fi and other wireless devices in schools.

On February 18, 2015, the UK agent for Lloyd's stated, "the Electromagnetic Fields Exclusion (Exclusion 32) is a General Insurance Exclusion and is applied across the market as standard. The purpose of the exclusion is to exclude cover for illnesses caused by continuous long-term non-ionizing radiation exposure i.e. through mobile phone usage."

This decision is important because Lloyd's of London, one of the largest insurance companies in the world, often leads the way in protection by taking on risks that no one else will. But, the decision is not surprising because Lloyd's refused to cover mobile phone manufacturers against risks to users' health more than a decade ago in 1999.

What (exactly) are the risks associated with Wi-Fi radiation?

In 2011, the World Health Organization designated radio frequency radiation of the type emitted by Wi-Fi devices to be a 'class 2B possible human carcinogen.' Many independent experts now think this classification downplays the significant dangers posed by wireless technology – especially when you consider the thousands of peer-reviewed, non-industry funded studies by scientists and medical experts that show that Wi-Fi radiation is harmful, especially to children.

According to Associate Professor Olle Johansson from the Department of Neuroscience at the Karolinska Institute in Stockholm "the debate is over". He says, "the spectrum of possible health problems arising is extraordinarily wide – from brain tumors and leukemia to exhaustion, decreased memory and concentration and just feeling uncomfortable."

Professor Johansson goes on to say, "The allowed radiation limits throughout the world are insane, to say the least. We are talking about values up to 1,000,000,000,000,000,000 (10 to the 18th) times higher than nature's background radiation, to which the human body has adapted through many 100,000 of years, and within a couple of decades, we have all been surrounded by biblical levels of artificial radio-waves, well knowing that they have major impacts on both human and animal health."

Princeton University recently removed its position statement on wireless safety from their website after parents raised concerns that Princeton's information was "outdated and inaccurate." Earlier, this year, France banned Wi-Fi in nursery schools. In addition, schools in Germany, Austria, Israel and Australia have pulled the plug on Wi-Fi altogether.

http://www.naturalhealth365.com/wi-fi-radiation-electromagnetic-fields-lloyds-of-london-1356.html

Reykjavik Appeal on wireless technology in schools

We, the signers, are concerned about our children's health and development in schools with wireless technology for teaching. A vast amount of scientific studies have shown considerable medical risks with long-term exposure to Radiofrequency Radiation (RFR) from wireless devices and networks well below the recommended reference levels from the International Commission on Non-Ionizing Radiation Protection (ICNIRP). We ask the authorities to take their responsibility for our children's future health and wellbeing.

In May 2011 the International Agency for Research on Cancer (IARC) at WHO classified RFR as a Group 2B carcinogen, i.e., 'possibly' carcinogenic to humans. Since then more scientific studies on exposure to RFR in humans, animals and biological material have strengthened the association of an increased risk for cancer, especially brain tumors. Several laboratory studies have shown mechanistic effects in carcinogenesis such as oxidative stress, down regulation of mRNA and DNA damage with single strand breaks. The IARC cancer classification includes all sources of RFR. The exposure from mobile phone base stations, Wi-Fi access points, smart phones, laptops and tablets can be long-term, sometimes around the clock, both at home and at school. For children this risk may be accentuated because of a cumulative effect during a long lifetime use. Developing and immature cells can also be more sensitive to exposure to RFR. Based on scientific studies no safe level of this radiation has been established and therefore we have no safety assurances.

Besides the cancer risk, RFR may also affect the blood-brain barrier to open and let toxic molecules into the brain, hurt neurons in hippocampus (the brain center for memory), down or up regulate essential proteins in the brain engaged in the brain's metabolism, stress response and neuro-protection and affect neurotransmitters. Sperms exposed to Wi-Fi have been seen with more head defects and DNA damage. RFR can increase oxidative stress in cells and lead to increase of pro-inflammatory cytokines and lower capacity to repair DNA single and double strand breaks.

Cognitive impairments in learning and memory have also been shown. Results from the OECD's PISA performance surveys in reading and mathematics show decreasing results in countries that have invested most in introducing computers in school. Multitasking, too many hours in front of a screen, less time for social contacts and physical activities with risk for aches in neck and back, overweight, sleep problems, and information technology (IT)- addiction are some of the known risks and side effects of IT. They stand in marked contrast to the often claimed, but largely unproven possible benefits.

We ask the school authorities in all countries to acquire knowledge about the potential risks of RFR for growing and developing children. Supporting wired educational technologies is a safer solution than potentially hazardous exposures from wireless radiation. We ask you to follow the ALARA (As Low As Reasonably Achievable) principle and Council of Europe Resolution 1815 to take all reasonable measures to reduce exposure to RFR.

Practical rules for schools concerning children and wireless technology.

- No wireless networks in preschool, kindergarten and schools.
- A hard wired direct cable connection is recommended to each classroom for the teacher to use during lessons.
- Prefer wired telephones for personnel in preschool, kindergarten and schools.

- Prefer cabled connection to Internet and printers in schools and turn off Wi-Fi settings in all equipment.
- Prefer laptops and tablets that can be connected by cable to Internet.
- Students should not be allowed to use cell phones in schools. They can either leave them at home or the teacher collects them in turned off mode before first lesson in the morning.

Children, Screen time and Wireless Radiation – International Conference Reykjavik February 24, 2017

http://www.stralskyddsstiftelsen.se/wp-content/uploads/2017/03/Reykjavik-Appeal-170224-2.pdf

Maryland State Advisory Council Recommends Reducing School Wireless to Protect Children

03/03/2017

Children's environmental health experts respond to new US study linking wireless radiofrequency radiation to cancer after the American Academy of Pediatrics recommends reducing radiofrequency exposures.

After reviewing new and growing evidence on health risks of wireless radiation, the Maryland State Children's Environmental Health and Protection Advisory Council (CEHPAC) issued a Report advising the Department of Education to recommend local school districts reduce classroom wireless radiation exposures by providing wired-rather than wireless-internet connections. CEHPAC's health experts include Governor appointed pediatricians, Maryland State House/Senate appointees and representatives of the Department of Education and Department of Health. Theodora Scarato, MSW, of the Environmental Health Trust, first brought the issue to the Council's attention three years ago, in February of 2014. The Council cited the recent US National Toxicology Program (NTP) findings of increased rates of rare malignant cancers in animals, as well as children's unique vulnerability to the radiation in their recommendations to minimize exposure.

Several countries, such as France, Israel and Cyprus, already have protective measures minimizing school wireless radiation exposures as national policy. However, CEHPAC's action to issue recommendations to reduce classroom wireless exposures is the first of its kind by an expert state body in the United States.

The Children's Environmental Health and Protection Advisory Council recommends:

1. "The Maryland State Department of Education should recommend that local school systems consider using wired devices" "Wi-Fi can be turned off" and instead "a wired local area network (LAN) can provide a reliable and secure form of networking...without any microwave electromagnetic field exposure."

2. New construction and renovations: "If a new classroom is to be built, or electrical work is to be carried out in an existing classroom, network cables can be added at the same time, providing wired (not wireless) network access with minimal extra cost and time."

3. The Maryland State Department of Education should recommend that local school systems use strategies to minimize exposures: "Have children place devices on desks to serve as barrier between the device and children's bodies; Locate laptops in the classroom in a way that keeps pupil heads as far away from the laptop screens (where the antennas are) as practicable; Consider using screens designed to reduce eyestrain; Consider using a switch to shut down the router when it is not in use."

4. "The Maryland Department of Health and Mental Hygiene should provide suggestions to the public on ways to reduce exposure: Sit away from Wi-Fi routers, especially when people are using it to access the internet. Turn off the wireless on your laptop when you are not using it. Turn off Wi-Fi on smartphones and tablets when not surfing the web. Switch tablets to airplane mode to play games or watch videos stored on the device."

5. "The General Assembly should consider funding education and research on electromagnetic radiation and health as schools add Wi-Fi to classrooms."

6. The Maryland Department of Health and Mental Hygiene should "ask the United States Department of Health and Human Services to formally petition the FCC to revisit the exposure limit to ensure it is protective of children's health and that it relies on current science."

7. The Report should be shared with the United States Department of Health and Human Services, Federal Communications Commission, Maryland State Department of Education and Maryland General Assembly.

"While this report focused on Wi-Fi radiation in schools, there are additional concerns about mobile phones and cell phone towers. CEHPAC plans to look at these broader issues over the next year," the CEHPAC Council Report states.

"Our children's healthy future rests on the responsible actions of today," stated Scarato. "21st century learning should include 21st century science," Scarato pointed to research that found wireless alters brain development in addition to increasing cancer. "Corded non-wireless connections in school are an important part of a safe and healthy school environment, respecting not only our children but also the teachers and staff."

Referring to the fact that US wireless public exposure limits were set in 1996, without testing for long term safety, the CEHPAC Council Report also stated that, "decades-old standards need updating in light of new science." Such statements are in line with the American Academy of Pediatrics, which has also called for a regulatory review and states that children's brains are less mature and can absorb proportionately twice the wireless radiation as an adult because of children's thinner skulls that contain more fluid.

"If you plan to watch a movie on your device, first download it, then switch to airplane mode while you watch in order to avoid unnecessary radiation exposure," recommends the American Academy of Pediatrics as part of its "Ten Tips on Cell Phone Radiation."

In response to the 2016 NTP study findings of a cancer link, the American Academy of Pediatrics, Consumer Reports, Obstetricians and several Medical Associations issued recommendations to reduce cell phone and wireless exposures to children. The American Academy of Pediatrics has also repeatedly called on the United States government to strengthen wireless exposure regulations to protect children and pregnant women.

The Council heard testimony from health organizations and from parents who reside in multiple counties in the State of Maryland, including Montgomery County, Prince Georges County, Anne Arundel County, Baltimore County and Howard County. The Council also received hundreds of pages of expert scientific material and comments prior to the final Report, which the Council has posted on their website.

"Parents have a right to know if there is an environmental hazard in the classroom and actions that can be taken to reduce exposure. The stakes are so high for our children, yet we are way behind what has been happening around the world. Over 20 countries have taken steps and in some cases passed legislation to protect their youngest and most vulnerable citizens and it is time we do the same for

ours," stated Montgomery County parent Laura Simon, pointing to countries like France, Cyprus and Israel.

"I was shocked to learn no government health agency had reviewed the issue from a health and safety standpoint considering how fast Wi-Fi was being installed in schools across the State." Scarato described the process of how she brought the health issue of children's exposures to wireless in schools to Maryland State agencies almost three years ago, by first writing letters of concern about the school radiation exposures.

Dr. Sharfstein, then Secretary of the Maryland Department of Health, initially responded to Scarato's concern by stating, "It is fair to say there are legitimate questions about the long-term health implications of microwave radiation" and that the Department of Health "would be interested in the advice and counsel of groups such as the Children's Environmental Health and Protection Advisory Council."

Scarato pointed out that the Education Department representative on the Council voted in favor of the CEHPAC recommendations to reduce wireless exposures. The Maryland State Department of Education (MSDE) also had responded to Scarato's initial concerns by referring her to CEHPAC, which "exists for the purpose of identifying environmental hazards that may affect children's health and recommending solutions to those hazards."

Medical researchers are pointing to an array of psychological, emotional and physiological health issues screens pose to children at the same time that schools are integrating wireless networks and one to one device initiatives into classrooms.

In 2017, Maryland lawmakers heard testimony on Bill HB866, a first in the nation bill to create uniform screen safety guidelines for screen use in public schools "to protect children from the documented health hazards posed by daily use of digital devices." In response to wireless radiation health concerns, many schools worldwide are replacing wireless systems with wired systems, and limiting time children spend on screens.

http://www.sbwire.com/press-releases/first-state-in-the-nation-maryland-state-advisory-council-recommends-reducing-school-wireless-to-protect-children-777904.htm

Cyprus Removes Wi-Fi from Kindergartens and Halts Wireless Deployment Into Public Elementary Schools

03/06/2017

The Cyprus Minister of Education and Culture issued a Decree on January 31, 2017, marked „urgent" to all Directors of Kindergartens and Primary Schools, with specific measures to eliminate and minimize wireless radiation exposure to children in schools. „We have taken the decision to have the wireless network Wi-Fi disabled in all Public kindergartens in Cyprus," reads the Decree. Wireless is to be removed from all Cyprus kindergartens, and wireless installations have been halted in elementary schools and limited to administrative offices.

"The Ministry of Education does not intend to proceed with the installation of wireless points and Wi-Fi access classrooms in elementary schools."

The Decree reminds teachers that wired internet is already available in all classrooms if the internet is needed for educational purposes. Wireless is only to be used, if needed, in the administrative areas of elementary schools, and wireless is not to be used in the classrooms.

However, if the use of Wi-Fi is deemed necessary for a specific educational program, the Decree stipulates that, „necessary measures to protect children should be taken, and wireless access points should remain inactive when not in use for teaching purposes." Furthermore, „the consent of parents should be ensured in advance." The Decree instructs the School Directors to assure parental consent and send a letter to the parents of children who will participate in programs involving wireless technology – informing the parents of the reason and duration of Wi-Fi usage.

Alongside their other campaigns about tobacco smoke and toxic chemicals, The Cyprus National Committee on Environment and Child Health initiated a nationwide campaign several years ago to raise awareness about cell phone and wireless radiation exposures to children. The multimedia public awareness campaign was lauded at an international conference on Wireless and Health held at the Israel Institute for Advanced Studies at Hebrew University in January of 2017, and organized in cooperation with the U.S. National Institute of Environmental Health Sciences (NIEHS) and Environmental Health Trust (EHT).

Dr. Stella Michaelidou, President of the National Committee on Environment and Child Health shared public service video announcements and brochures about children and pregnancy at the conference. „This Committee has developed tools that are a model for other countries to follow," stated Devra Davis, PhD, MPH, of the Environmental Health Trust at the conference.

Several countries already have health policies in place to reduce school children's exposure to wireless. Cypress now joins France, Brazil, Ghent in Belgium, and Israel in banning wireless in kindergarten classrooms and enacting strong measures to minimize wireless exposures in elementary schools. France passed comprehensive new legislation in 2015 and has developed tools to inform the public about how to reduce exposure, similar to the efforts underway in Cyprus. Canada's Standing Committee on Health of the House of Commons also issued a report recommending a public education campaign.

In the United States, the Maryland State Children's Environmental Health and Protection Advisory Council recently issued a Report advising the Department of Education to recommend all school districts in the State of Maryland install wired—rather than wireless—internet connections for classrooms. This

action represents the first action of a state advisory body to issue guidance on wireless exposures. In Massachusetts and Oregon, several Bills have been proposed to address the health issues posed by electromagnetic radiation in schools and raised by consumers, researchers and medical professionals as concerns about school wireless exposures gains momentum in the United States.

http://www.satprnews.com/2017/03/06/cyprus-removes-wi-fi-from-kindergartens-and-halts-wireless-deployment-into-public-elementary-schools/

Radiofrequency Radiation in Communities and Schools Actions by Governments, Health Authorities and Schools Worldwide

See source for document.

http://ehtrust.org/wp-content/uploads/International-Policy-Precautionary-Actions-on-Wireless-Radiation.pdf

Wi-Fi banned from pre-school childcare facilities in a bold move by French government

The French National Assembly has adopted a bill to limit exposure to electromagnetic fields (EMFs) generated by wireless technologies - cell phones, tablets, Wi-Fi etc. This bill will mean the following:

- A ban on Wi-Fi in all childcare facilities for children under the age of 3.
- Cell phone manufacturers will have to recommend the use of hand-free kits.
- A ban on all advertising targeting children under 14.

Children's EMF exposures are a particular cause for concern. Studies show that children's brains can absorb up to three times as much radiation compared to adults.

A recent International Agency for Research on Cancer (IARC) report suggested that EMF exposures can be more devastating in children because their:

- Brain tissue is more conductive.
- Skull is thinner.
- Smaller brains and softer brain tissue allows radiation to penetrate more effectively.
- Potentially longer period of exposure due to use beginning at an earlier age.

This new French bill seems to have taken these concerns into account.

EMFs are widespread in our daily environment. Anything electrical creates an electromagnetic field. According to the French national Agency for Food, Environmental and Occupational Safety (ANSES):

- The biggest source of EMF exposure by far is cell phones.
- Cell towers exposures are developing very rapidly with the deployment of 4G, but average exposure is well below that of phones.
- Electrical power lines, transformers and railway lines are also sources of EMFs.

•Wireless devices in our personal environment expose us to radiofrequency EMFs: computers and tablets, Wi-Fi, Bluetooth and electronic chips, as well as fluorescent lights, microwave ovens, induction hotplates and washing machines.

ANSES now urges "limiting exposure of the population", particularly to cell phones. It also encourages the use of an earpiece.

ANSES already rang the alarm bell in October 2013. After evaluating more than 300 international studies, the agency published a report highlighting the biological effects of EMFs on humans and animals concerning sleep, male fertility and cognitive performance.

A spokesperson for ANSES stated that "the massive development of technologies relying on radiofrequencies, leading to intensive exposure of the population, specifically more sensitive persons, which cannot be avoided". They went on to say that the deployment of 4G "will be accompanied by increased exposure of the public".

French exposure limits are based on a 2002 decree. They are set at 61 volts per meter (V/m) for 3G and 4G, the same as in the USA. The Council of Europe recommends an exposure limit of 0.6 V/m, some 100 times lower.

Switzerland and Liechtenstein and eight Member States of the European Union (Belgium, Bulgaria, Greece, Italy, Lithuania, Luxembourg, Poland, Slovenia) have adopted more restrictive limits than those of France.

In Europe there is a growing recognition of the plight of persons suffering ill health from exposure to electromagnetic fields, a condition known as electrical hypersensitivity or electrical sensitivity. This new bill requires that the French government provides Parliament with a report detailing "the opportunity to create areas of limited electromagnetic radiation, notably in the urban environment". It also requires that the conditions of electrosensitives by taken into account in the workplace.

Though this bill has to be adopted by the French Senate for it to be made into law, clearly this bill reflects the buildup of public opinion in France and other European countries that EMF exposures are dangerous and the public needs protecting. How long before US public opinion is successful in introducing similar protective legislation?

http://www.naturalnews.com/043695_electrosensitivity_Wi-Fi_French_government.html

Could Wi-Fi in schools be harming our kids?

Students in Lindsay Freedman's split Grade 3/4 class at Red Willow Public School are working away on tablets, laptops and iPods. It's Bring Your Own Device day, a regular occurrence here, and supplementing the devices brought from home are 20 school-owned iPads. Freedman walks around the classroom, marveling at her students' instant embrace of the online presentation app she's just introduced. "They're an instant motivator," she says, referring to the tools in their hands.

Red Willow belongs to the Peel District School Board (near Toronto), one of several across Canada that have adopted Wi-Fi throughout its schools, an embrace of 21st-century technologies designed to "ensure that our students can thrive in a future that can't be predicted," as Peel's promotional brochure puts it.

Though most parents and educators celebrate the move, some are raising concerns about the possible health impacts of the radio-frequency (RF) radiation on which wireless technologies operate. Exposure levels to this kind of radiation, which fall in the same frequency bandwidth on the electro-magnetic spectrum as radios, televisions and mobile phones, continue to rise as wireless technologies become more prevalent.

Canada's current guidelines on RF exposure are in line with those of the International Commission on Non-Ionizing Radiation Protection – the largest regulatory body in this field. But many other jurisdictions have adopted considerably lower limits, either as a precautionary measure or because they view the science differently.

How is it that health agencies reach such different conclusions when faced with the same scientific evidence? Why are some Canadian schools installing Wi-Fi while France is limiting exposure? Switzerland heavily favors wired Internet connections in schools, yet Israel is pulling it out of its lower grades altogether.

While most Western bodies have deemed the scientific evidence on health effects inconclusive, many European jurisdictions are choosing to err on the side of caution until more is known. In a resolution in 2011, the Council of Europe recommended that the As Low As Reasonably Achievable (ALARA) principle be applied to electromagnetic radiation, fearing "there could be extremely high human and economic costs if early warnings are neglected." It also condemned the "lack of reaction to known or emerging environmental or health risks and virtually systematic delays in adopting or implementing effective preventive measures."

Lichtenstein, Italy and Belgium responded by drastically lowering their exposure guidelines. In France, a bill currently before the Senate insists on a principle of moderation where RF radiation is concerned. If passed, Wi-Fi will be banned from maternity wards and child-care facilities, communities would have to be consulted before any installations in schools, and if installed, all routers would have to be accessible to teachers who could turn them off when not in use. Laurence Abeille, the Green MP behind the bill, had originally proposed a ban in all schools around students up to the age of six. She had to water it down to gain broad support in the National Assembly, but feels public concern in France is rising. This spring, a 32-year-old man received medical benefits from the local health authority in Essonne, south of Paris, for his electro-hypersensitivity – a first in France.

Switzerland prides itself on having among the most stringent regulations on electromagnetic radiation in the world. As of 2000, it has supplemented its exposure limits (which are in keeping with Canada's) with much more restrictive limits for installations of power lines, television and radio transmitters, and mobile phone base-stations in well-frequented locations. The new regulations were accompanied by an aggressive public awareness campaign about the health risks of RF radiation. Swisscom, the national telecom company, promotes its line of low-radiation "Ecomode" phones and routers as "safer" – openly acknowledging the risks inherent in these devices. And for 10 years, Swisscom has been installing wired Internet connections in Swiss schools for free. Why not wireless? As company spokesman Carsten Roetz wrote in an e-mail, "because there's no reason to put a radiation source that isn't absolutely necessary in schools." Of Switzerland's 6,800 schools, Roetz estimates that fewer than 100 have opted for wireless connections.

In March of this year, the Jerusalem Post reported that the Israeli Education Ministry had ordered radiation testing in all Israeli schools, banned Wi-Fi from pre-schools and kindergartens, and restricted its use to one hour a day for students up to Grade 3. The move came in response to persistent complaints from parents whose children suffer from some form of electromagnetic hypersensitivity.

Russia's exposure limits for RF radiation are 100 times lower than Canada's. While Russian schools can choose to install Wi-Fi, they are the exceptions, says Oleg Grigoriev, chairman of the Russian National Committee on Non-Ionizing Radiation Protection (an expert group that reports to the Russian parliament). He says damage to children's cognitive function caused by long-term exposure to low-strength electromagnetic fields has long since been demonstrated by Russian researchers. Russia, he explains, began experimenting with the impacts of electromagnetic fields on the nervous system a century ago, and, as a result, does not consider its approach precautionary, but rather "science-based."

While faced with the same scientific evidence, these countries have adopted very different rules on exposure. It's all about managing risk. Marc Saner, a professor at the Institute for Science, Society and Policy at the University of Ottawa, affirms that scientific evidence is just one element in the multi-factorial nature of risk management in public policy. "The focus on risk reflects many things – a country's history of science, its trade interests, the pet causes of its movie stars … Policy decisions are always a few steps away from data, there's always an emotional component."

Most Canadian school boards are introducing Wi-Fi, but at a slower rate than Peel – slower not because of concern about exposure, but because installation is more complicated in older schools with thicker walls. Toronto's school board aims to have at least partial Wi-Fi in all its schools by 2016, and is adding zones regularly. Because Wi-Fi exposure has been deemed safe in Canada, the expansion proceeds without notification.

Paradoxically, outside the schools' walls, Toronto's Board of Health insists on a "prudent avoidance policy" with respect to cell tower locations, keeping RF radiation levels in areas of the city "where people normally spend time" 100 times lower than what federal guidelines insist on – much like in Switzerland. The Board argues that as long as radiation sources in the urban environment continue to increase, the cumulative effect is unknown and caution is warranted. The policy has been in place since 1999.

In Canada, the lack of public concern about Wi-Fi exposure in schools seems at odds with a culture of parenting that's often called hyper-cautious. Here, public awareness on the issue of exposure has been

mainly focused on cellphones. The science at play is beyond the reach of most citizens, and many would rather not entertain the possibility that these incredibly useful technologies may pose a risk.

"We're not just talking about Wi-Fi in schools," Saner says. "We're asking much bigger questions, like what is education? Are these devices good for society generally? Is this speed of innovation a good thing? The stakes here are huge."

http://www.theglobeandmail.com/life/health-and-fitness/health/is-there-such-a-thing-as-too-much-Wi-Fi/article18592972/

Teen Allergic to Wi-Fi Commits Suicide, Parents Say

The mother of a teen who committed suicide after suffering from what she calls a rare allergy to Wi-Fi is accusing her daughter's school of failing to protect her.

Jenny Fry, 15, was found hanging from a tree near her home in the U.K. last June. Her story is now coming to light because of a legal investigation into the cause of Jenny's death.

Her mother, Debra Fry, told the Mirror that Jenny suffered from blinding headaches, fatigue, concentration problems, and bladder issues that she says were caused by electro-hypersensitivity syndrome (EHS), a condition in which electromagnetic radiation emitted from wireless technology, including Wi-Fi, cellphones, and cell towers, causes debilitating physical symptoms.

Although Jenny's parents had removed Wi-Fi from their home, which helped, it was still present at her school. "Both Jenny and I were fine at home, but Jenny continued to be ill at school in certain areas," said Fry.

Jenny received several detentions in school, not for being disruptive in class, but because she'd often have to leave the classroom to find an area away from Wi-Fi where she could concentrate.

Fry had shared information about Wi-Fi's potential problems with the head teacher of Jenny's school, Simon Duffy, but according to Fry, Duffy told her there was an equal amount of information that shows Wi-Fi is harmless.

"I also had a heated exchange with teachers telling them Jenny was allergic to Wi-Fi, and that it made no sense making her take detentions in rooms that were making her ill," said Fry. "The least they could do was allow her to take them in rooms where she felt able to concentrate, but they wouldn't listen."

Fry believes Jenny's suicide attempt was meant to be a cry for help. A police statement said that on the day Jenny died, she had texted a friend twice, telling the friend about her intentions to commit suicide and stating where she was, according to the Mirror. But her friend didn't have her phone with her to see the texts in time.

"Jenny left letters for us where she said she couldn't cope with her allergies from Wi-Fi anymore," Fry told the Telegraph. "She left them for us in case things went too far, but I don't believe she wanted to die."

Arthur Firstenberg, a leading anti-electromagnetic health activist, admits that EHS is not a simple subject, but that it's not taken seriously enough by the medical community. Firstenberg believes there are genuine health issues stemming from the escalation of wireless technology, and that schools have a responsibility to keep children safe. "Imagine if this was a toxic chemical, and the school suddenly decided to spray the chemical throughout the school just because other schools were doing it," Firstenberg told Yahoo Parenting. "Don't people have a responsibility for what they do, regardless of whether others are doing it too?"

"Just because Wi-Fi is new and all around us doesn't mean it is safe," Fry told the Telegraph. "Wi-Fi and children do not mix. Much more research needs to be done into this because I believe that Wi-Fi killed my daughter."

Jenny's parents are now trying to raise awareness about the dangers of Wi-Fi. Fry added, "I am not against a bit of technology, but I do feel schools should be aware that some children are going to be sensitive to it and reduce its use."

https://www.yahoo.com/news/teen-allergic-to-Wi-Fi-commits-suicide-parents-say-223912154.html

Cell Phone Usage Inside Schools

My kids have been educated on the dangers of electromagnetic radiation (EMR) from cell phones, cordless phones and Wi-Fi networks, so they were aware enough to come home and tell me how they're unwillingly getting exposed to EMR at their school – via other kids' cell phones and the wireless computers in the computer room.

My children have told me that many children in their classes own cell phones, which are allowed to remain turned on, whilst in the classroom. Whether these phones are set to ring or just vibrate is not the issue. If they are turned on, then they are transmitting (and receiving) to the nearest cell phone tower continually and emitting electromagnetic radiation (EMR) throughout the classroom.

My son has also told me that all the computers in the computer room are wireless. Again, as computers on a Wi-Fi network are in the "ultra-high frequency range" and nearly up to the "super high frequency" range (see info below on radiation frequencies from NASA), this likewise is transmitting very high EMR to the children (and teachers) in that classroom.

When we were in Singapore in 2001, there was huge coverage in all the newspapers because 20-year-olds throughout the city were having heart attacks and they couldn't figure out why. Then, someone figured out it was because it was the fashion at that time for young people to wear their cell phones on decorative cords around their necks. This meant that their cell phones were hanging right next to – you guessed it – their heart. So a warning went out in all the local newspapers, telling kids not to wear their cell phones on these cords. But funnily enough, no one I've spoken to in Canada (or the U.S.) ever heard about that. And no one thought about warning people not to wear their cell phones clipped to their belt, or in their pocket.

Of course there are huge revenues at stake with wireless technology and until recently, not much long-term hard data on the risks or effects. But as you can see from the first reference listed below (from the head of a cancer research institute), that has now changed, and there IS enough data in place for respected scientists and doctors to conclude that cell phone and other ultra-high frequency wireless devices are not safe for long-term, or cumulative human use – *especially* for children.

I have also listed my own research below – including hard data from NASA's website, that has led me to completely avoid cell phone, cordless phone and wireless computer usage in my family and my house.

Many people are comparing cell phones and Wi-Fi network usage to cigarettes – which were also once thought to be a "private" choice, but later acknowledged as a public health issue – where your choice affects my health.

I encourage you to review the research and sources below – of the thousands of references available (over 2,000 scientific, peer-reviewed studies), I have included only a few of the most pertinent.

And if you would like a set of "action tools" that you can download and hand out to neighbours, schools, other parents, etc. to help get Wi-Fi removed from your school, they're all available at my kids' site: www.RadiationEducation.com

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Associated Press

Thurs., July 24, 2008

PITTSBURGH – The head of a prominent cancer research institute issued an unprecedented warning to his faculty and staff Wednesday: Limit cell phone use because of the possible risk of cancer.

The warning from Dr. Ronald B. Herberman, director of the University of Pittsburgh Cancer Institute, is contrary to numerous studies that don't find a link between cancer and cell phone use, and a public lack of worry by the U.S. Food and Drug Administration.

Herberman is basing his alarm on early unpublished data. He says it takes too long to get answers from science and he believes people should take action now — especially when it comes to children.

In the memo he sent to about 3,000 faculty and staff Wednesday, he says children should use cell phones only for emergencies because their brains are still developing.

Adults should keep the phone away from the head and use the speakerphone or a wireless headset, he says. He even warns against using cell phones in public places like a bus because it exposes others to the phone's electromagnetic fields.

"Although the evidence is still controversial, I am convinced that there are sufficient data to warrant issuing an advisory to share some precautionary advice on cell phone use," he wrote in his memo.

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CBC News

Saturday, July 12, 2008

"Toronto's department of public health is advising teenagers and young children to limit their use of cellphones to avoid potential health risks."

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Dr. Robert Becker, M.D., one of the first medical pioneers to study natural electrical currents in the human body and to caution about electropollution, answers the question, "Can EMR exposure cause harm?" in this interview. Dr. Becker was twice nominated for the Nobel Prize in Medicine.

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Good summation article on CELL PHONE RISKS TO CHILDREN by Dr. Joseph Mercola:

Children today will experience previously unimaginable exposure to information-carrying radio waves from mobile phones because they start out using them at a very early age.

I am absolutely convinced that the explosion of cell phone usage around the world is a health disaster in waiting, and contributing to the rapid rise in several neurological epidemics, such as autism and early-onset of Alzheimer's.

One reason for this is that the information-carrying radio waves from cell phone base stations and cell phones make children's exposure to vaccines and heavy metals much more dangerous than they typically are. EMR can actually trap heavy metals inside your cells, causing cellular damage and

hindering your body from detoxifying. For this reason — while I realize that most people will not get rid of their cell phones because of their convenience — I would still urge you to not let your kids use them.

I am so convinced this danger is real, on par with the dangers of tobacco, which all the "experts" claimed was safe, that I'm writing an entire book on the subject, due out in 2009.

And, I'm not alone in trying to educate the public. In fact, some European countries are already working on public health campaigns designed to warn school-age children of the dangers, by putting up posters in schools and community halls.

Will Europe Ban Cell Phones for "Under-age" Use?

The Vienna Medical Association is demanding the removal of zero tariffs and the banning of mobile phone advertising targeting children and adolescents. Says Erik Huber, environment advisor for the association: "Children under the age of 16 should never use a mobile phone."

Many scientists and government agencies in Europe have already accepted that EMF from cell phones does pose health risks, reflected in Huber's statement, "Scientists do not argue anymore whether mobile phones are harmful, but how harmful they are."

Don't be Deceived – SAR is Not an Indication of Safety

Although the National Research Council's report states that Specific Absorption Rates (SAR) for children are likely to be higher than for adults, let's not get confused.

Because the danger from most land-based portable phones, cell phones and Wi-Fi routers is NOT from the magnetic radiation or the microwave carrier wave for which typical SAR ratings are given on phones. Unless you have massive exposures like you might expect in a microwave oven, these thermal effects are insignificant.

So simply lowering the allowable SAR will NOT make cell phones safer.

Instead, nearly all the biological damage comes from the modulated signals that are carried ON the carrier microwave. These modulated information carrying radio waves resonate in biological frequencies of a few to a few hundred cycles per second, and can stimulate your cellular receptors causing a whole cascade of pathological consequences that can culminate in fatigue, anxiety, neurological decline, and ultimately cancers.

The density of your child's skull is also far less than yours, and therefore their brain is far more susceptible to these information-carrying radio waves.

This Deserves Your SERIOUS Attention

The studies showing the long-term risks of cell phone use are just beginning to come in because cell phone use didn't become widespread until the late 1990s. It typically takes at least 10 to 20 years for cancers to show up, so now is the time when these risks will become apparent.

It is almost as if NO ONE was smoking and then all of a sudden nearly 90 percent of the planet started. Of course, we would not see any spectacular increase in major damage for more than 10 years. It takes time for this damage to accumulate and be noticed.

Unfortunately, most people fail to correlate common symptoms and health problems to their exposure to cell phones and other radio frequencies, perhaps because these conditions can so easily be attributed to other causes (including so-called "unknown" causes) as well.

Take a look at these common illnesses and ailments, which have all been scientifically linked to cell phone information carrying radio waves:

* Alzheimer's, senility and dementia
* Parkinson's
* Autism
* Fatigue
* Headaches
* Sleep disruptions
* Altered memory function, poor concentration and spatial awareness

Although cancer and brain tumors are most often cited as the potential health risks from cell phone radiation, as you can see, cancer is not the only, or most common danger that you and your children face.

Protecting Yourself and Your Children From Dangerous RF

The best way to protect yourself would be to simply not use a cell phone and revert back to a corded phone. At the very least I would urge you to not let your kids use them or severely limit their use. Their developing nervous systems and thinner skulls are simply too vulnerable to cell phone damage.

If you choose to keep your cell phone, make sure you use a non-Blue Tooth headset. Also remember, even when you're not using your phone, keep it as far away from your body as possible. Do not keep it on your belt or in your pocket as the radiation WILL penetrate your body wherever the phone is attached. According to a scientific study published in Fertility and Sterility in May 2007, statistically significant changes were found in men's sperm count and health of the sperm, based on cell phone use.

Their conclusion?

"Use of cell phones decreases the semen quality in men by decreasing the sperm count, motility, viability and normal morphology. The decrease in sperm parameters was dependent on the duration of daily exposure to cell phones, and independent of the initial semen quality."

So, make sure you stow your cell phone in a bag, briefcase, or your car's glove compartment.

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Dr. Carolyn Dean MD ND recently shared this information:

Last September Dr. Devra Lee Davis, an epidemiology professor from the University of Pittsburgh testified before the U.S. Senate…

"Dr. Davis," asked Senator Tom Harkin, chairman for Health & Human Services, "you said that a cell phone should not be kept any closer than an inch to your body?"

Dr. Davis nodded.

"Where does that come from?" asked Senator Harkin.

"That actually comes from the BlackBerry manual," replied Dr. Davis, "as well as from the iPhone manual. If you read the manual– which almost none of us does — that is what they say."

Seeing is believing… so I found a PDF copy of iPhone's "Important Product Information Guide" online which states: "iPhone's SAR measurement may exceed the FCC exposure guidelines for body-worn operation if positioned less than 15 mm (5/8 inch) from the body…"

The BlackBerry manual takes it 10mm further by advising: "…keep the device at least 0.98 inches (25mm) away from your body…"

So if you can't avoid cell and cordless phones entirely — at least do what the industry's own manuals suggest: Avoid any direct physical contact while they are activated.

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An article in the Los Angeles Times reported:

"Belgium, France, Finland, Germany, Russia and Israel have publicly discouraged use of cellphones by children. (Independent research in Sweden last year concluded there was an astonishing 420% increased chance of getting brain cancer for cellphone users who were teenagers or younger when they first started using their phones.) France has gone so far as to issue a generalized national cellphone health warning, banned cellphones in elementary schools and considered outlawing marketing the phones to children."

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WI-FI RESEARCH

You can go here to NASA's site to get an easily understood definition of exactly what electromagnetic radiation is, and the distinction between the different types of waves.

This article tells you what wavelength/frequency wireless computer devices work with (frequency and wavelength are inter-related as explained in the NASA article):

Once we know the frequency wireless (Wi-Fi) technology uses, we can then compare that to Radios and TVs.

FM Radio is in the 88 – 110MHz range

Analogue TV (what most people have in their homes) is at 400 – 600MHz

Digital TV is at 600 – 1000MHz.

Here's a great definition of radio frequency and then an excellent chart showing the strength of the various frequencies:

Radio frequency is also abbreviated as rf or r.f. – any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation.

These frequencies make up part of the electromagnetic radiation spectrum:

- Ultra-low frequency (ULF) — 0-3 Hz
- Extremely low frequency (ELF) — 3 Hz – 3 kHz
- Very low frequency (VLF) — 3kHz – 30 kHz
- Low frequency (LF) — 30 kHz – 300 kHz
- Medium frequency (MF) — 300 kHz – 3 MHz
- High frequency (HF) — 3MHz – 30 MHz
- Very high frequency (VHF) — 30 MHz – 300 MHz
- Ultra-high frequency (UHF)– 300MHz – 3 GHz
- Super high frequency (SHF) — 3GHz – 30 GHz
- Extremely high frequency (EHF) — 30GHz – 300 GHz

CONCLUSION: WI-FI IS NOT SAFE FOR FREQUENT, ONGOING USAGE

So, based on the information gathered above, here's where each item (cell phones, radio, TV, wireless computers) lies in terms of intensity of electromagnetic radiation:

FM Radio is 88-110 MHz –> Low frequency electromagnetic radiation

Cell phones are 824-869 MHz –> Ultra-high frequency electromagnetic radiation.

Wireless computers/internet are 2.4 GHz –> Ultra-high frequency electromagnetic radiation (but nearly up into Super High frequency range).

Therefore, surprise-surprise, wireless computers and their networks are NOT SAFE for frequent, ongoing human use! And when salespeople, politicians and presidents of wireless companies tell you that "there's no problem, it's the same as FM Radio" – you will know they are lying, or misinformed.

Worrying also is current TV transmission at 400-600 MHz (Ultra-high frequency) and Digital TV in the 600-1000MHz range (also Ultra-high frequency). But at least one tends to sit a good distance away from a TV!

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For lots more info on this issue, check out the EMR Network (a non-profit organization).

http://blog.listentoyourgut.com/cell-phone-usage-inside-schools/

Landlines

Saving Your Landline May Save Your Life

See source for publication.

https://wirelessaction.files.wordpress.com/2016/09/saving-your-landline-may-save-your-life-sccma-bulletin_may-2016.pdf

Mauk said her landline was the only thing working in her house after the 2015 windstorm

Lee Ann Mauk spent nine days without power after Spokane's 2015 windstorm. She couldn't turn lights on, take a hot shower or keep food frozen. But through it all, her landline phone kept working.

"We didn't have stoves. We didn't have hot water. We didn't have refrigerators. But we did have our phone," she said.

It's no secret that the number of households with landlines is dwindling across the United States.

As of December 2015, the most recent data available from the Federal Communications Commission, Spokane County had 96,000 active residential landlines. That's about one for every two households. That number is down from the June 2014 FCC count, which showed 106,000 residential landlines in Spokane.

In Kootenai County, the number for both snapshots was 40 percent.

We asked readers to weigh in about whether they had a landline and why on Facebook and got nearly 100 responses.

Those who still have landlines said the ability to reach kids at home, power outages and call quality were all reasons to keep the phone around.

Jenny Louie said she uses her landline to sign up for things that require a phone number, and so she doesn't have to get her 11-year-old a cellphone.

"We need a phone at home that they can use in case of emergency," she wrote. Others pointed out schools still teach young kids to dial 911 on a landline.

Some readers said they felt more secure in an emergency knowing 911 dispatch can read their location off a landline. But it's not quite that simple, said Spokane fire communications dispatch chief Jay Atwood.

Traditional landlines that rely on cables, usually provided by CenturyLink in Spokane County, transmit an address to 911 dispatch. But cellphones often do, too, and in many cases, the location is fairly accurate.

"Sometimes it can be really precise and sometimes it's a quarter-mile off," Atwood said.

Cellphone location pinpointing is a county-by-county technology. Spokane has had it for years, Atwood said, and tends to be ahead of the curve. Smaller or more rural counties may not have that ability.

What can be a problem are landlines that use the internet to transmit calls. Those landlines, called voice over internet protocol, or VOIP, are usually the ones that come bundled with Comcast or other cable TV service.

Atwood said VOIP landlines come up with the subscriber's address, based on whatever information they have in their account. If someone's recently moved and hasn't updated that information, 911 could end up with the wrong address.

Regardless of how a call comes in, 911 dispatchers always ask for a location to avoid confusion.

"We always confirm the address no matter what," Atwood said. "It's never one of those things we take for granted."

Some people said they keep a landline around because of spotty cellphone service at home. Surprisingly, FCC data show little correlation between how rural a county is and the percentage of households with landlines.

Landline coverage is highest by far in Wahkiakum County in southwestern Washington, at 82 percent. But Whitman County saw the lowest coverage in the state, at just 39 percent. Other more rural counties, including Asotin, Adams, Douglas, Kittitas and Walla Walla, are between 40 and 50 percent, while 54 percent of King County households still have a landline.

Among readers who had given up a landline, telemarketers were a big reason. Many said they didn't see the point of paying for an extra service, cheap though it can be. Some said they got rid of it when their children got old enough to have cellphones.

"I got rid of mine when I got comfortable with having just a cellphone, but I have been thinking a lot about getting a landline again. I never missed a call when the house phone rang like I do with my cell," wrote Vicki Denz, who's in her early 50s.

State regulations have shifted over the past three years to reflect the declining number of people using landlines. The state Utilities and Transportation Commission used to regulate the price phone companies could charge for service, since they usually had a monopoly. In 2014, they stopped price regulations on landlines in most areas because of the competition provided by VOIP, Skype, cellphones and other options.

"There wasn't a need to discipline prices under regulation anymore because the assumption, and I think it still holds, is that the marketplace will discipline their prices," said Brian Thomas, the director of policy for the commission. The commission does still regulate consumer safety, including 911 availability.

The Department of Social and Health Services used to require a landline phone for foster parents, but dropped that requirement around 2013. Now, regulations say only that parents must "have access to a working telephone at all times" while children are at home.

Mauk's house has a functioning rotary phone, along with a more modern device upstairs. She still uses the rotary dial to make calls, though it can be tricky if she has to go through an automated menu after reaching her local pharmacy.

http://www.spokesman.com/stories/2017/feb/11/about-half-of-spokane-households-still-have-a-land/

A Landline Might Be Your Best Option during a Storm

Think about how much life has changed since Hurricane Andrew, some 24 years ago. We likely had that wall phone in the kitchen with the really, really, really long cord. We got most of our news from television, radio or newspapers. The web was something Spiderman produced as he battled villains.

Imagine if we had today's technology back then. We could text, Snap, Tweet, Facebook-message, Instagram, etc. all of our loved ones instantly how we were dealing with the post storm damage and stress. We could jump on the utilities apps to see all we need to know about when we might get power back. There are probably apps that let us know which gas station has fuel, which stores have bread and milk or the closest emergency center for aid of any kind.

Wait, no, we probably couldn't do all those things because today's technology is dependent on energy and Wi-Fi. And after a storm like Andrew, we would likely be out of both. So, we might have to go into the attic and pull out the old wall unit after all.

Mimi Whitefield of the Miami Herald recently wrote about this strange phenomenon and shared her ideas on how to communicate if another big storm comes through.

WLRN: I use my phone as an alarm, as a radio and my source of news oftentimes. Looking at my checklist, I'm not prepared. Do you think people are ready for another storm?

Whitefield: Well, we may not be prepared. We have all these technological advances. There are all these apps out there that help you deal with natural disasters, weather, lots of information, but you're not necessarily going to be getting those if the power goes out and inevitably it does during a storm.

The telephone companies such as Verizon and AT&T say that their towers and their systems are able to withstand quite a bit of wind damage and storm damage. But are they confident their systems can withstand an Andrew?

I think with each storm and each natural disaster they learn a little bit more. They will move their personnel and their equipment into an area that they think is going to get slammed and they've got these mobile cell phone units. But of course these things can't move into an area until after the debris is cleared. And so they have a lot more capacity, they are a lot more robust than they were 10 years ago when the last major hurricane hit Florida, but it's kind of an unknown about how they will be able to perform it...if a major hurricane hits.

What did you take away from researching and writing this story and has it changed anything in the way you view what you have to do to get ready?

I think I may go out and buy some battery packs and these are relatively inexpensive. You can probably get one for $20-$25 but you can plug your cell phone in there, you could maybe plug your laptop, a fan, some lights, unless you are really able to splurge for a generator, but you want to have power. And even the ability of news organizations dependent on power, dependent on the Internet to get their message out there, could be challenged as well.

I remember specifically with Andrew and we were trying to call our families everywhere else to let them know what was going on. And I know my mom was going days trying to get through trying to get through. Did they [phone companies] learn anything from the experiences after Andrew?

What they recommend, because they really don't want to jam up the phone lines and the cell networks, is well in advance of a storm designate a friend or someone in your family as your central contact point. Try to get in touch with that person and that person try to get in touch with everyone else after a storm, like your information central. So instead of calling 10 friends and family members you're making that one call. I think that obviously could help quite a bit. You cannot go on your cell phone during a storm for entertainment or to play games. It's basically for an emergency, that and you're likely to get denial of service.

One thing that has changed a lot, about 47 percent of American households are cell-phone-only households. I do have a landline at my house and I keep it specifically for this reason, but I have wireless phones. They will not work because they're dependent on electricity, so I keep an old style telephone and I pull it out whenever the weather is bad.

http://wlrn.org/post/ready-go-old-school-landline-might-be-your-best-option-during-storm

Landlines: The 'Dinosaur Phone Technology' That Could Save You in a Crisis

As cell phone service has grown reliable and more widely available, many households have given up their landline telephones.

Today, about two-thirds of younger Americans use cell phones only, and about 40 percent of households overall have given up landlines.

This, though, can be a problem during an emergency.

Some, but not all, cell towers have backup generators, but during Hurricane Sandy they provided only an additional four to six hours of power. In Long Island, N.Y., every single cell phone tower eventually failed, leaving an entire community holding worthless cells phones.

"There was one woman in particular who passed away, of natural causes, an elderly woman," city manager Jack Schnirman told *NPR*. "And her daughter had to walk literally a mile and a half from her home to police headquarters just to say, 'Listen, my mom has passed, and I thought I should tell somebody."

Said college student Colleen Marron, "It was scary because you don't know what is going on. You feel helpless."

Additionally, cell towers are not designed to handle a mass of people calling all at once.

Landline phones, assuming they are not wireless, generally work during a power outage. This is because power is sent to the phones through the phone line from the power companies. The power companies have battery backup and backup generators so that their operations can continue for well over a week during a power outage.

The lines often are underground, preventing them from being damaged during a storm. That's a selling point for landline companies who are trying to maintain customers.

"When the power's out, a landline phone connection will work more than 99.9 percent of the time," says a TDS Telecom website. "It's required by the FCC. This means you can still reach 911 and friends

and family; they can all reach you, too. Even if a major storm (tornado or hurricane) comes through the area. It might take out the cell tower, but it can't take out the underground phone lines."

In other words, during a power outage, cell phone towers will exhaust their battery power within a matter of hours, while landlines will work for well over a week, maybe more (depending on the ability of the phone company to keep its generators running).

http://www.offthegridnews.com/how-to-2/landlines-the-dinosaur-phone-technology-that-could-save-you-in-a-crisis/

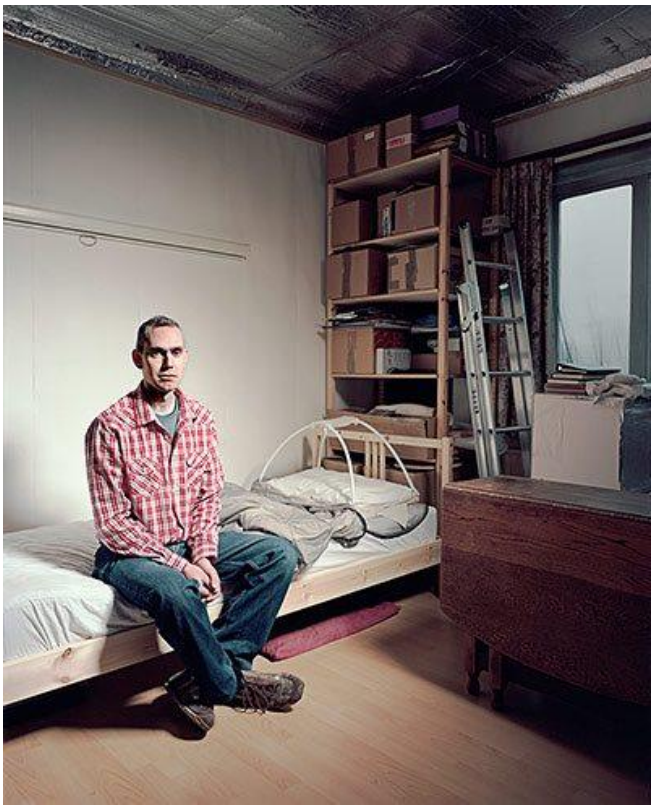
Electromagnetic Hypersensitivity

Electrosensitivity: is technology killing us?

Is modern life making us ill? Yes, say those who suffer from electrosensitivity. Are they cranks, or should we all be throwing away our mobile phones?

Tim Hallam, Leamington Spa

Tim is a science and history of art graduate from Cambridge University. He has insulated his bedroom and has fitted foil on the walls, under the floor and on the ceiling. He sleeps in a custom-made silver-coated sleeping bag every night, which helps block out electromagnetic fields. Tim can't work in an office environment and the condition has severely impacted his career aspirations. He currently drives a supermarket delivery van. 'Where I'm living now, it's not a great situation,' he says. 'I'm lucky that the shielding worked to a large degree. But I would love to live somewhere I didn't have to live in a metal box and sleep in a bag, where I could go to a cafe and see my friends, go to the cinema – all those things that people take for granted.'



Damian May, Reading

Damian is a cabinet maker and runs a property-maintenance business. He discovered he suffered from electrosensitivity after buying a Nintendo Wii for his family for Christmas. It triggered severe headaches and body pains. His electrosensitivity has made it very difficult for him to run his company, because he finds it painful to work in areas with Wi-Fi or mobile phones. He has turned off everything wireless in his home, has insulated his office and is campaigning to have Wi-Fi removed from his son's school.

Eileen O'Connor, Merseyside

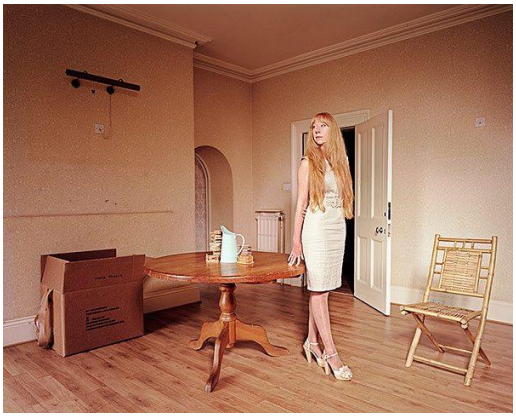
Eileen lived 100m from a mobile phone mast for many years in Wishaw. She experienced many symptoms typical of electrosensitivity, but could not work out the cause. When she was diagnosed with breast cancer aged 38 and discovered that a number of her neighbors had similar symptoms and cancers, she became part of a very public campaign to have the mast removed. She is a director for The Radiation Research Trust charity and works with the International EMF Alliance. 'It's heartbreaking to see people who are not getting support at the family,' she says. 'It's awful. It's a double insult, really – not only are you suffering with this terrible condition, but then you've got people who think you're going crazy at the same time.'

Chris McKenzie, Cumbria

In 2008, when Chris moved into his own flat, he quickly became ill and suffered headaches, body pains and insomnia. He attributed this to exposure to Wi-Fi, which he had never lived with before. His family found it hard to understand the condition, especially when he wore a tin foil hat at home and stopped work as a stone mason. His mother sent him to a psychologist for help, and he was placed on heavy medication and sent to a psychiatric ward against his will. 'There were questions coming everywhere, they were putting words into my mouth. They were saying, "You know this isn't real, don't you?" I got dragged away to a psychiatric ward with people who have serious mental conditions.' He sought help from the charity Electrosensitivity UK and was later released. He now lives on his own and has made various attempts to shield his home from electromagnetic fields with carbon paint and aluminum foil.

Doctor Erica Mallery-Blythe, Lincolnshire

Erica worked as an emergency medical doctor for 12 years in trauma rooms across the UK and abroad. In 2008 she became interested in radiation research and is now a medical advisor for the charity Electrosensitivity UK. She advises EHS sufferers on how to improve their health, and in serious cases has given refuge at her rural home to people needing to escape their home environments. 'It's very uncharted territory in terms of what exactly EHS is, and how many people it's affected. My own personal instinct is just like with so many other things we see in life, it's a bit of a bell-shaped curve. You've got some people who show almost no reaction whatsoever to an EMF challenge, and others you would say have EHS, who are at the other side of that curve, and their life is utterly turned upside down by it, given the modern world. Most people will probably fall somewhere in between.'



Clare Woodward, Devon

Clare worked as a computer programmer for nine years and then retrained as a complementary therapist. When her family moved into a new house in Devon, she began suffering from insomnia and heart palpitations, which she attributed to a mobile phone and Tetra* mast very close by. They have since insulated their home at great expense with carbon paint and specialist windows.

**Tetra - Terrestrial Trunked Radio – is a powerful two-way radio system primarily used by the emergency services*

Hannah Metcalfe, Kent

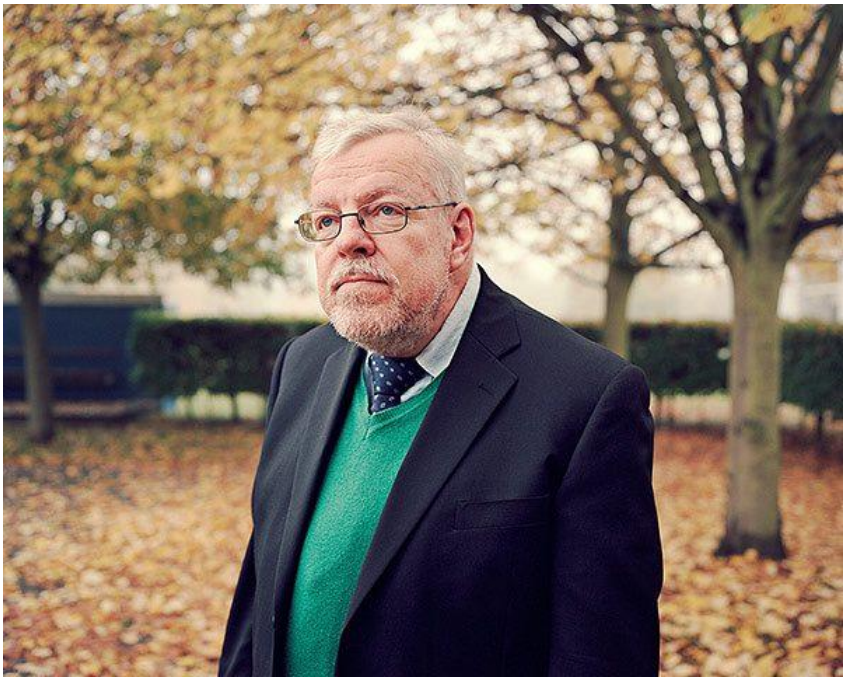
Hannah suffered from psoriasis as a child and started sun bed treatment at the age of nine to help clear up her skin. In her late 20s, she started developing severe migraines and fatigue when working in offices with fluorescent lights. She always felt discomfort when using a mobile phone. The severity of her symptoms got worse when she later discovered a sensitivity to Wi-Fi. She gave up her job as a trainee criminal solicitor in 2010 and now lives with her husband and two children on a farm in Kent. 'When I realized that Wi-Fi was making me ill, I also turned off the digital phone, so [there] was nothing wireless in the house. I went from feeling like this sluggish person to feeling so vibrant and alive, with so much energy. It's just amazing to feel well.'

Freda Thornhill, retired teacher
Freda's first symptoms of electrosensitivity began in 1999 while using computers and CRT monitors at school. The condition became so severe that she had to give up her job. She is now also affected by mobile phones and Wi-Fi, and spends extended periods of time away in her 'lifeboat van' so she can escape the electromagnetic fields at home.

Jenny Layton, Devon
When she developed unexplained headaches, tinnitus, heart palpitations and insomnia, she and her GPs were at a loss as to the cause. After months of research, she finally attributed her symptoms to a new neighbor who had set up Wi-Fi next door.

Michelle Berriedale-Johnson, London
Michelle has run a series of magazines and websites for 20 years, covering issues related to food allergy and intolerance. Her electrosensitivity began after heavy use of mobile phones and CRT computer monitors for work. She is now also affected by Wi-Fi and has insulated much of her home. She is photographed wearing a jacket made from a silver-coated material that reduces the strength of electromagnetic fields.

Professor Olle Johansson, department of neuroscience, Karolinska Institute, Sweden
'From the very beginning, it was said that this was just a post-menopausal problem in women. Then men started to report electro hypersensitivity, and the self-proclaimed experts said it's actually only elderly [people], because they are afraid of new technology. We then started to get children and teenagers and young people, and they rolled out a new explanation, which was that it's actually people with higher education. And it went on like this. But today you can see that any political color, any income class, both sexes, all age groups, are affected.'



Raphael Cuesto, London

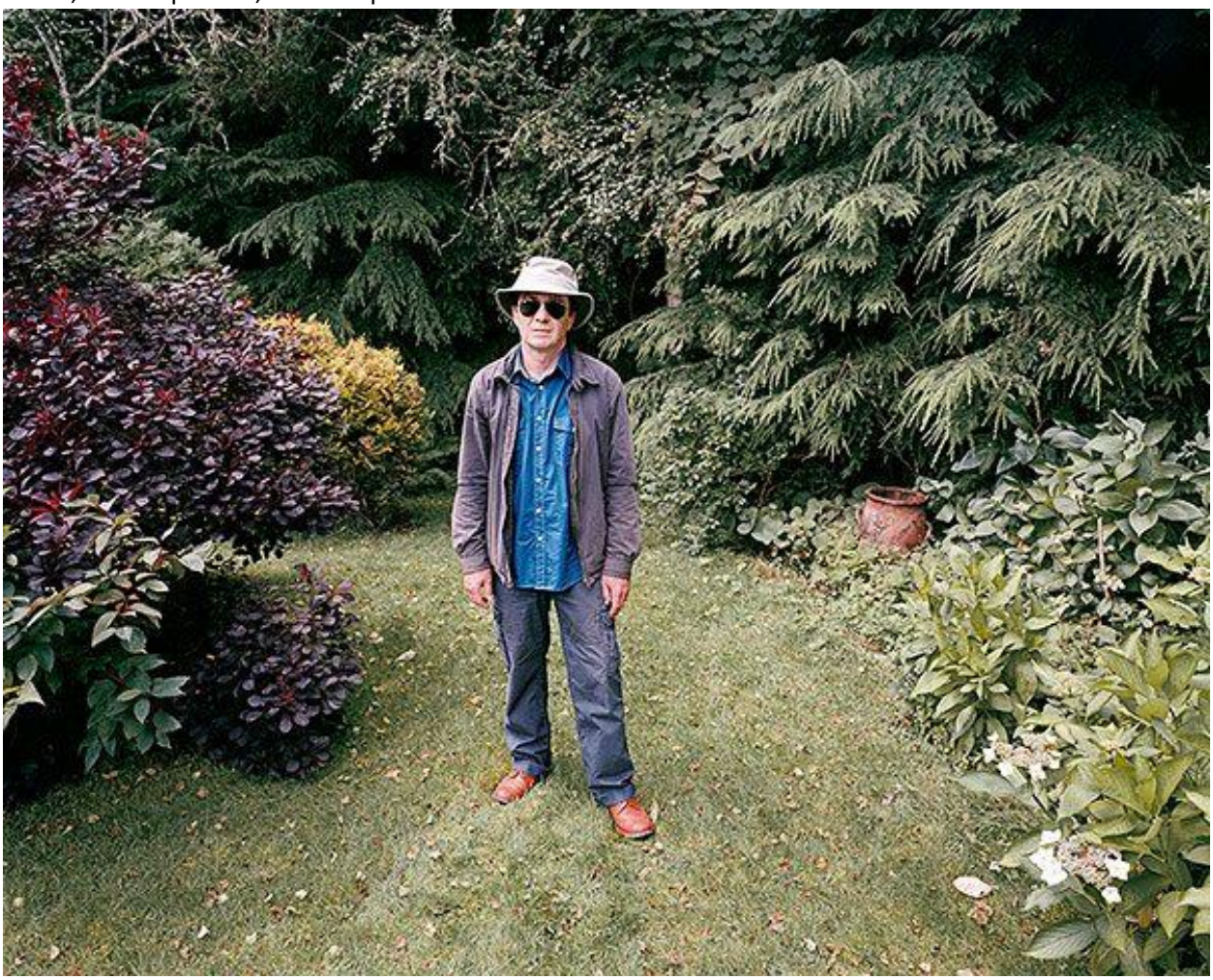
In 2004, while working for a telecommunications company in Kuala Lumpur, Raphael noticed that he was developing pains in his arms and hands every time he worked on his laptop. His symptoms got worse and he began getting headaches and heart palpitations when using his mobile for only a few minutes, and this progressed to almost immediate pain when he brought the phone near his head. He decided to stop using his mobile altogether and left his job. He is now a teacher. 'When you spend a minute on the phone and get palpitations, you know you have to do something about it. I remember one day turning [over] a piece of paper and writing in the middle of the page, "Jobs without a mobile phone." I had to change everything.'

Ray Parsons, Weston-Super-Mare, retired joiner

When Ray started developing severe fatigue and body pains in his late 40s, he initially thought he had developed ME. After eight years of analyzing his symptoms, he concluded that he was, in fact, suffering from electrosensitivity. He is photographed in his sitting room, where he has fitted a silver-coated netting over the window that reduces the strength of electromagnetic fields.

Steve Miller, Cornwall

Steve is a successful record producer. His electrosensitivity to Wi-Fi and mobile phones has forced him radically to change his lifestyle and to give up touring almost entirely. 'I went to see a friend in Falmouth and he's surrounded by student flats and Wi-Fi coming in from all directions. I put up with it for a while because I thought, 'I'm being rude, there's something other than this, something's wrong with me'. By the time I actually managed to leave, I staggered out of the building, couldn't drive for an hour – I didn't feel safe to drive – and then felt rotten for next two days. It was at that point I spoke to a GP about it and he said you're probably electrosensitive to pulsed microwave radiation, which is, wireless, phone masts, mobile phones, cordless phones.'



https://www.theguardian.com/society/gallery/2013/mar/29/electrosensitivity-technology-killing-us-photographs

Electromagnetic Hypersensitivity: Evidence For A Novel Neurological Syndrome

ABSTRACT

Objective: We sought direct evidence that acute exposure to environmental-strength electromagnetic fields could induce somatic reactions (EMF hypersensitivity).

Methods: The subject, a female physician self-diagnosed with EMF hypersensitivity, was exposed to an average (over the head) 60-Hz electric field of 300 V/m (comparable to typical environmental-strength EMFs) during controlled provocation and behavioral studies.

Results: In a double-blinded EMF provocation procedure specifically designed to minimize unintentional sensory cues, the subject developed temporal pain, headache, muscle-twitching, and skipped heartbeats within 100 s after initiation of EMF exposure ($P < 0.05$). The symptoms were caused primarily by field transitions (off-on, on-off) rather than the presence of the field, as assessed by comparing the frequency and severity of the effects of pulsed and continuous fields in relation to sham exposure. The subject had no conscious perception of the field as judged by her inability to report its presence more often than in the sham control.

Discussion: The subject demonstrated statistically reliable somatic reactions in response to exposure to subliminal EMFs under conditions that reasonably excluded a causative role for psychological processes.

Conclusion: EMF hypersensitivity can occur as a bona fide environmentally-inducible neurological syndrome.

DISCUSSION

Appropriately controlled provocation studies are required to establish the existence of EMF hypersensitivity and to understand the relative importance of psychological and nonpsychological processes in mediating any observed symptoms. A working laboratory definition of EMF hypersensitivity formulated in symptomological terms is therefore needed to permit recognition of hypersensitivity reactions when they occur. In previous provocation studies the assumption was made that true hypersensitive subjects would exhibit more or less the same symptoms in response to repeated provocations. The assumption led to experimental designs that involved averaging across exposed and control groups, which is an inherently insensitive statistical procedure for detecting real but variable responses [3, 4]. The assumption is particularly inapplicable to EMF hypersensitivity because intra- and inter-subject variability are its salient features [1, 2]. We defined EMF hypersensitivity as the occurrence of any medically recognized symptom in response to provocation using an environmentally relevant EMF; there was no requirement that the same symptom must reoccur when the EMF provocation was repeated. This definition avoided the problem of masking real effects and more appropriately matched the laboratory procedure to the known characteristics of EMF hypersensitivity [1, 2]. We focused on a single self-reported subject and employed a procedure in which she served as her own control. While controlling for artifacts, chance, and somatization, the question whether she reliably exhibited any symptomatic responses to an EMF was addressed; the alternative hypothesis was that she did not exhibit EMF-triggered symptoms. The laboratory conditions were controlled in such a way that a putative role of psychological processes could reasonably be identified. The subject developed symptoms in association with the presentation of a pulsed electric field significantly ($P < 0.05$) more often than could reasonably be explained on the basis of chance (Table 3). Several considerations

suggested that the statistical link was a true causal association with a subliminal EMF. First, the subject's environment was carefully controlled to avoid putative confounding factors. The testing took place in an acoustically quiet environment and the presence of uncontrolled environmental EMFs was nil. The environmental conditions during the field-exposure and shamexposure intervals were identical except that during the sham-exposure intervals, at a point far removed form the subject's field of view, the wires carrying the plate voltage were disconnected. A key aspect of our laboratory procedure was the elimination of sensory cues that could serve as conscious markers of the electric field leading to a somatization reaction. All appropriate precautions were taken to eliminate potential confounders. Second, the occurrence of symptoms was significantly associated with the type of EMF (Table 4). The symptomatic response was associated with the pulsed EMF, which maximized occurrence of the number of transient changes in the EMF (off-on and on-off), not with the presence of the field, as expected on the basis of prior animal studies where the issue of somatization was irrelevant [9]. Finally, in a behavioral study specifically designed to assess awareness of the field, yes response rates were 8.7% and 9.9% in the field and sham conditions, respectively, which provided no evidence for a psychological role in the development of the subject's symptoms. We therefore conclude with a reasonable level of certainty that the causal association we found between the presence of the EMF and the subject's symptoms was mediated by a subconscious neural process. Although chance was an unlikely explanation for the association, that possibility could not be excluded. The existence of the neurological syndrome reported here was previously suspected, but not documented. The mechanism for the subject's symptoms of headache, visual disturbances, and somatic musculoskeletal discomfort following exposure to EMFs is unknown. Based on clinical evaluation, intermittent seizure activity is not a credible explanation, although a deeper epileptic focus with partial seizure activity may have escaped the detection of surface EEG electrodes. The abnormal findings in the subject's medical workup included the abnormal MR image (cortical dysplasia and polygyric changes) and extensive sleep discontinuity and fragmentation manifested in the overnight polysomnogram; the possible association of these findings with the subject's syndrome of EMF hypersensitivity is unknown. Our aim here was to concentrate on the previously unaddressed question whether acute exposure to weak EMF could produce real but not precisely predictable somatic effects mediated by nonpsychological processes. Within the limitations of the study we concluded that we demonstrated the neurological syndrome in the subject we studied. The question of whether EMF hypersensitivity is a significant public-health problem was not addressed here. The EMF we employed was equivalent in strength and pulse structure to EMFs pervasively present in the environment [1, 2], and our results were consistent with the possibility that environmental EMFs can directly trigger clinical symptoms. Nevertheless resolution of the public-health issue depends on a deeper understanding of how internal EMFs caused by environmental EMFs are related to physiological process, and of the role of psychological factors and co-morbidities in the exposed population in exacerbating the processes resulting in disease.

http://electromagnetichealth.org/wp-content/uploads/2011/08/McCarty_Marino_2011_EMF_ES__neurological_syndrome_Int_J_Neurosci_July.pdf

Electromagnetic Field Sensitivity

Abstract

A multiphase study was performed to find an effective method to evaluate electromagnetic field (EMF) sensitivity of patients. The first phase developed criteria for controlled testing using an environment low in chemical, particulate, and EMF pollution. Monitoring devices were used in an effort to ensure that extraneous EMF would not interfere with the tests. A second phase involved a single-blind challenge of 100 patients who complained of EMF sensitivity to a series of fields ranging from 0 to 5 MHz in frequency, plus 5 blank challenges. Twenty-five patients were found who were sensitive to the fields, but did not react to the blanks. These were compared in the third phase to 25 healthy naive volunteer controls. None of the volunteers reacted to any challenge, active or blank, but 16 of the EMF-sensitive patients (64%) had positive signs and symptoms scores, plus autonomic nervous system changes. In the fourth phase, the 16 EMF-sensitive patients wer rechallengd twice to the frequencies to which they were most sensitive during the previous challenge. The active frequency was found to be positive in 100% of the challenges, while all of the placebo tests were negative. We concluded that this study gives strong evidence that electromagnetic field sensitivity exists, and can be elicited under environmentally controlled conditions.

Introduction

Interaction mechanisms that underlie the health and biological effects of electromagnetic fields (EMF) on humans have been studied by many authors.1,2,3,4,5,6 This subject was reviewed recently at the 1990 spring meeting of the American Physical Society .7 Choy et. al.8 investigated individuals with multiple sensitivities who reported reactions to various types of electrical equipment, including power lines, electronic office equipment such as typewriters and computer terminals, video display terminals, household appliances (such as hair dryers), and fluorescent lights.

This paper presents preliminary data on electromagnetic field tests using a square wave generator to evaluate the EMF sensitivity of patients reporting such sensitivities under environmentally controlled and monitored conditions.

Results

Phase I. The EMF measurements were quite reproducible. We found that the lights. and air handling equipment had to be off during the tests because of their electromagnetic field output. Baseline studies on patients were completed without remarkable result.

Phase II. Of the total of 100 patients tested in the single-blind study, 50 reacted to several of the placebos in addition to the active challenges, and were excluded from further study. Twenty-five subjects who did not react to any active challenges were also excluded. A final 25 subjects who did react to active challenges, but not to blanks, were selected for the third phase of the study (Table 1).

Phase III. The 25 subjects selected from phase II were rechallenqed, and 16 (64%) reacted positively to the active challenges. The total number of positive reactions to the 336 active challenges in the 16 patients was 179 (53%), as compared to 6 positive reactions out of 60 blanks (7.5%). There were no reactions to any challenge, active or placebo, in the volunteer group of naive subjects (Table 2).

When evaluating frequency response, 75% of the 16 patients reacted to 1 Hz, 75% to 2.5 Hz, 69% to 5 Hz, 69 % to 10 Hz, 69% to 20 Hz, and 69% to 10 KHz (Table 3). No patient reacted to all 21 of the active frequencies in the challenges. The average was 11 reactive frequencies per patient, with a range of 1 to 19 positive responses.

The principal signs and symptoms produced were neurological (tingling, sleepiness, headache, dizziness, unconsciousness), musculoskeletal (pain, tightness, spasm, fibrillation), cardiovascular (palpitation, flushing, tachycardia, edema), oral/respiratory (pressure in earss tooth pains, tightness in chest, dyspnea), gastrointestinal (nausea, belching), ocular (burning), and dermal (itching, burning5 prickling pain) (Table 4). Most reactions were neurological.

Phase IV. In the 16 patients again rechallenged in a double-blind manner, using only the single frequency to which they were most sensitive, all reported reactions to the active frequencies when challenged. None reacted to the placebos (Table 5). Signs and symptoms in all 16 patients were positive as was the autonomic nervous system dysfunction, as measured by the iriscorder (Table 6, Figure 1). Examples of changes were a 20% decrease in pulmonary function and a 40% increase in heart rate. In the 16 patients with positive reactions to EMF challenges, two had delayed reactions; gradually became depressed and finally became unconscious. Eventually, they awoke without treatment. Symptoms lasted from 5 hours to 3 days.

Discussion

Since it has been found that electromagnetic fields can affect health, researchers have investigated these phenomena in vivo and in vitro, in animals10,11,12 and humans.1,2,3,4,5,6,7 No individual had been specifically challenged in an attempt to reproduce acute symptoms until Smith and Monro5 followed by Choy, Monro, and Smith,8 who used a series of oscillators of varying frequency to trigger symptoms in electrically sensitive patients. We modified this procedure by developing controlled environmental area, where baselines were constantly monitored for particulates, pollutants, and extraneous fields. Here, controlled EMF output was applied so that data would be more reproducible.

Several factors have led us to believe that we have reproducible results. Meticulous construction of environmental rooms made a great difference in the reproducibility of test results. Prior to the use of such facilities and careful monitoring, a variety of factors, such as diet, exposure to chemicals, EMF, or dust gave rise to symptoms which would have been mistaken for placebo reactions. Such effects were minimized here, as evidenced by the sinail number of placebo reactions. A few patients reacted to the tields generated by the monitoring devices (Iriscorder, EKG, and computers) and had to be dropped from the study as too fragile for accurate analysis. Some patients reacted to the fields generated by the fluorescent lights, and others did not present the same signs and symptoms at each challenge, even though the reactions were significant when contrasted with the blank responses. The Iriscorder data were objective, however, and were always reproducible (Figure 1).

We also noted that patients sometimes had delayed or prolonged responses. Therefore, care had to be taken to be certain that the patient had returned to baseline before the next challenge. This carry-over was first noted when evaluating responses to placebo challenges. Such a response could usually be explained and eliminated by use of longer intervals between challenges.

In this study, of the 100 patients who expressed suspicion of EMF sensitivity, 75 actually responded to fields, whereas none of the controls did. Of the 75, 25 had no reactions to blanks, whereas 50 did, and

thus were discarded from the study; even though we felt that some of the reactions to blanks might be evidence of delayed reaction to previous frequencies, or prolonged response to the previous positive challenge, as well as true placebo reactions.

We learned that challenge with 21 frequencies was impossible on many sensitive patients. They were often unwell for several hours or days, which confused the data from repeat challenges on subsequent days. Hence, we selected the one frequency of maximum sensitivity for repeat challenges in the phase IV studies.

When one compares the various groups to controls, it is clear that there is a group of patients who have unstable response systems which appear different from those of the individuals who acted as controls. These studies show that EMF sensitivity could be elicited under environmentally controlled conditions. As a result of the weak field levels and short exposure time, the responses were mild except in two patients whose symptoms were so severe (e.g., drop attack, severe itching) that they received intravenous vitamin C, magnesium, and oxygen as a result of the prolonged and delayed reactions.

Signs and symptoms appeared similar to those seen in food or chemically sensitive patients at the Environmental Health Center-Dallas, and included neurological, musculoskeletal, cardiovascular, respiratory, gastrointestinal, dermal, and ocular changes. The neurological symptoms were most comon. Similar responses have been recorded by others in the literature.5,6,7,6,13,14 In 1972, after the Soviets reported that electrical utility workers were suffering from listlessness, fatigue, and nausea, Subrohmangam and coworkers13 investigated and reported decisive changes in cardiac function and bioamine levels when pulses of 0.01 and 0.1 Hz were used. They found significant changes in the hypothalamus in response to the EMF fields.

In these studies, the preponderance of reactions occurred at one to 10 Hz, which accords well with their observations. However, many reactions also occurred at 50 and 60 Hz, as well as some up to 5 MHz. We conclude that in any given individual susceptibility may develop to any frequency and produce reactions.

Static magnetic fields are known to cause increased blood pressure on some individuals.14 Choy and coworkers8 found that EMF reactions in EMF sensitive patients were not limited to the nervous system, but occurred in the same systems as in these studies, which basically corroborate theirs, though neurological symptoms predominated in our experiments.

Over the past 30 years, numerous investigations with animals and a few epidemiological studies of human populations have been devoted to assessing the relationship of microwave exposure to cataract development. The severity and speed of formation depends not only on intensity, but also on wavelength and duration of exposure.16-21 McCally et al.22 reported damage to corneal epithelium in Cynomolgus monkeys after 2.45 GHz irradiation for 6everal hours at only 20-30 mW/cm^2 (CW) or even 10-15 mW/cm^2 with pulsed fields. Therefore, the results of Paz23 strongly suggests that the potential for eye injury exists in surgery where EMF fields are present.

In our experience, the patients' clinical responses could not always be reproduced completely, but the objective Iriscorder, EKG, and respirometer could be. However, the responses were definitely different from controls or placebo challenges. In our experience over the years, we have found partial reproduction of symptoms on repeat challenge to be as significant as total reproduction. Therefore, significant differences from controls in objective ineasurementa were deemed valid.

There are several explanations for lack of exact reproducibility. These are the following: (a) the patients total body loads were different at different exposure periods. For example, some patients may only respond to EMF when in a reactive hypersensitive state;5,8 (b) tissue resistance could influence the effect of the EMF. Zimerman24 reported that electrical resistance of skin decreased with increasing temperature and increased with progressive drying, as might be expected; (c) injections of antigen neutralizing substances prior to test may have reduced the response to EMF. One patient with asthma was sensitive to high voltage power lines a well as low voltage house wiring. He experienced muscle spasms in head, neck, arms, and legs. This patient was also sensitive to dust, weeds, dust mites, and some foods. He reacted in our tests to 2.5 and 60 Hz and to 5 and 50 KHZ with tightness in the chest. He then received an antigen shot to neutralize his hypersensitivity reactions. Five months later, he was unreactive to EMF; (d) weather changes might affect the results, since we know that the weather can influence the propagation of EMF, as may alterations in the geomagnetic fields. Since humidity, pollution, temperature, etc. can affect resistance and total body load, weather should perhaps affect the results. Adverse weather (inversions, for example) may increase pollution load, while good weather lessens it. There is some evidence of resonance between geomagnetic fields and an applied ac magnetic field,25 which implies that the results may depend in part at least upon the strength and orientation of the geomagnetic field in the test area; and (e) different wave forms might cause different responses. In these experiments, we used only square wave inputs to the coils. Consequently, we do not know whether other wave forms (sine, sawtooth, triangular, etc.) might induce different types or intensities of reactions.

Thus far, definitive information has not been sufficient to identify a plausible mechanism for EMF interactions with biological tissue. Interactions appear to take place at the cell surface, perhaps acting on receptor sites and altering ion and molecular transport across the membranes.25 Further work remains to be done in the field.

It is clear that EMF sensitivity is a real phenomenon in some environmentally sensitive patients, because some had consistent reactions while none of the controls did. This study must be considered as only preliminary, but the evidence clearly points to sensitivity in some people.

In conclusion, it is evident that EMF testing is at a rudimentary stage; but clearly EMF sensitivity exists and can be elicited under environmentally controlled conditions. Further studies are needed to investigate the effects of EMF fields on human health.

http://www.aehf.com/articles/em_sensitive.html

Science: Plant and Animal Electromagnetic Sensitivity

Introduction

- **Animal Electromagnetic Sensitivity long known:**
  Animal sensitivity to electromagnetic exposure has been known as long as human electromagnetic sensitivity. The biological effects of the electric eel were known in ancient times. From the 17th century scientists studied how electricity and magnetism affected both animals and humans. Many modern studies depend on animal or plant research to establish biological pathways before moving on to human studies to verify low-level effects of electromagnetic exposure.
- **Animal and plants do not experience Electrophobia:**
  One great advantage of animal and plant studies is that there is no likelihood of confusion between real Electromagnetic Sensitivity and psychological Electrophobia, since animals and plants cannot be conditioned by a cognitive, as opposed to a behaviorally conditioned fear, and cannot therefore suffer from a 'Nocebo' effect, although anyway studies show that the 'Nocebo' effect is not part of real human Electromagnetic Sensitivity.

Plant Electromagnetic Sensitivity

The electromagnetic sensitivity of plants is now well established. It is used in many aspects of horticulture and agriculture. Since many biological electromagnetic effects have 'windows' or bands of effects, and these effects can be opposite to those of other 'windows', care is needed to apply the appropriate frequency.

A school experiment on the growth of cress under Wi-Fi and non-Wi-Fi conditions became international news.

- Daniel Bean: "Can Wi-Fi Signals Stunt Plant Growth?" (ANC News, 2013)

The increase in fungus and viral attacks on different species of trees has been linked with reduced immune systems because of man-made electromagnetic pollution, as has reduced anthocyanin production.

- Katie Haggerty (2010) "Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations" (Int J Forestry Res. 2010)
- Dan Nosowitz: "Wi-Fi Radiation is killing trees, new study finds" (Popular Science, 2010)
- René Schoemaker: "Study finds Wi-Fi makes trees sick" (Macworld, 2010)

Trees near cellphone towers show increased disease, starting on the side closest to the tower. Experts say that cellphone towers should be banned because of the damage they are causing to nearby trees.

- Waldmann-Selsam C et al: "Tree damage in the vicinity of mobile phone base stations" (Umwelt-medizin-gesellschaft. 2013; trans.)

- Waldmann-Selsam C et al: "Radiofrequency radiation injures trees around mobile phone base stations" (Sci Total Environ., 2016)
- Waldmann-Selsam C et al: "Trees in Bamberg and Hallstadt in the radiation field of 65 mobile phone base stations: Examples from a documentation about 700 trees (2006-2016)" (Sci Total Environ. 2016)

The effects are specific to types of plants, parts of plants, and exposures. Wi-Fi may be particularly harmful to some plants.

- Grémiaux A et al: "Low-amplitude, high-frequency electromagnetic field exposure causes delayed and reduced growth in Rosa hybrid" (J Plant Physiol., 2016)
- Soran ML et al: "Influence of microwave frequency electromagnetic radiation on terpene emission and content in aromatic plants" (J Plant Physiol., 2014)
- Stefi AL et al: "The effect of the non ionizing radiation on cultivated plants ofArabidopsis thaliana (Col.)" (Flora, 2016)

About 90% of studies on cellphone radiation on plants show physiological changes:

- Halgamuge MN: "Review: Weak radiofrequency radiation exposure from mobile phone radiation on plants" (Electromagn Biol Med., 2016)

Plants' environmental sensitivity, memory and cognitive control:

Plants show the ability to learn behaviors from sensitivity to electromagnetic and other environment factors, even though they lack an animal's nervous system, suggesting that pathways like calcium-based regulation can include memory and drive cognitive processes based on a variety of stress sensitivities. As with humans, not all plants display this learnt behavior by association, with about 60% responding and 40% not responding. The metabolic state of the plant and electromagnetic cues from visible light are also significant, with learnt behavior occurring according to the internal circadian rhythm mainly in subjective day. Epigenetic mechanisms help with transcriptional regulation to build systemic acquired resistance at distant sites.

- Baluška F et al.: "On Having No Head: Cognition throughout Biological Systems" (Front Psychol., 2016)
- Crisp PA et al.: "Reconsidering plant memory: Intersections between stress recovery, RNA turnover, and epigenetics" (Sci Adv., 2016)
- Dener E et al.: "Pea Plants Show Risk Sensitivity" (Curr Biol., 2016)

- Espinas NA et al.: "Epigenetic Control of Defense Signaling and Priming in Plants" (Front Plant Sci., 2016)
- Gagliano M et al.: "Experience teaches plants to learn faster and forget slower in environments where it matters" (Oecologia, 2014)
- Gagliano M et al.: "Learning by Association in Plants" (Sci Rep., 2016)

Insect Electromagnetic Sensitivity

It is well established that some insects are especially electrosensitive, including bees and ants.

- Cammaerts MC: "Is electromagnetism one of the causes of the CCD? A work plan for testing this hypothesis" (2017)
- Cammaerts MC et al.: "GSM 900 MHz radiation inhibits ants' association between food sites and encountered cues" (2012)
- Cammaerts MC et al.: "Food collection and response to pheromones in an ant species exposed to electromagnetic radiation" (2013)
- Favre D: "Mobile phone-induced honeybee worker piping" (2011)
- Gould JL et al.: "Orientation of Demagnetized Bees" (1980)
- Panagopoulos D et al: "Effect of GSM 900-MHz Mobile Phone Radiation on the Reproductive Capacity of Drosophila melanogaster" (2004)
- Sharma VP et al.: "Changes in honey bee behaviour and biology under the influence of cell phone radiations" (2010)

Animal Electromagnetic Sensitivity

This is now well established for a wide range of biological conditions.

- Geomagnetic effects

bird and animal migration (Kishkinev DA e al, 2014)

nest-building (Malkemper EP et al, (2015)

animal orientation and location in:
bats (Tian LX et al, 2015)
cattle and deer (Begall S et al, 2008)

dogs (Hart V et al, 2013)

fish (Takebe A et al, 2012)

lizards (Diego-Rasilla FJ et al, 2017)

- Pre-Seismic Eelectromagnetic Sensitivity:

  Sensitivity to pre-seismic changes in the electromagnetic environment, especially if transmitted through water, either sea water or water on land, appears to correlate with established effect before earthquakes on a variety of animals.

  In 373 BCE, animals including rats, weasels and snakes left the Greek city of Helice before an earthquake and tsunami:
  "For five days before Helike disappeared, all the mice and martens and snakes and centipedes and beetles and every other creature of that kind in the city left in a body by the road that leads to Keryneia." [quinque enim diebus priusquam pessum iret Helice, omnes in ea mures, mustelae, serpentes, scolopendrae verticilli, et alia hujusmodi animalia, magnis copiis exibat per viam, quae ducit Coriam] (Claudius Aelianus, *De Natura Animalium*, XI.19)

  Before the February 4 1975 earthquake at Haicheng, China, there were reports of anomalous animal behaviour, including among animals such as rats, snakes appearing frozen on roads, cows and horses becoming restless and agitated, rats appearing drunk, chickens refusing to enter their coops and geese frequently taking flight (Adams RD, 1976; Anon., 1977)

  Since 2000 many studies have suggested that animals are sensitive to the electromagnetic changes before earthquakes.

  In 2003 Dr Kiyoshi Shimamura in Japan reported a jump in dog bites and other dog-related complaints before and after earthquakes. He examined records of complaints from public health centres affected by the 1995 earthquake in Kobe and found that accounts of dogs barking "excessively" went up by 18% on average in the months before the earthquake. Above the epicentre on Awaji Island, there was a 60% increase in complaints compared with a year earlier. (Alok Jha: "Can dogs really predict earthquakes?" Guardian, October 2 2003)

  Another study concerned toads at L'Aquila, Italy, in 2009. Since then studies have included anomalous behaviors in many other animals, including ants, cows, pets such as cats and dogs, and milk yields in cows 340 km from the subsequent epicenter.

  Ceteceans, such as whales and dolphins, show, through mass beachings, sensitivity to changes in electromagnetic energy, probably including geomagnetic changes before earthquakes:
  Klinowska M: "Cetacean live stranding sites relate to geomagnetic topography" 1985

  "It is my observation, confirmed over the years, that mass suicides of whales and dolphins that occur sporadically all over the world, are in someway related to change and disturbances in the electromagnetic field coordinates and possible realignments of geotectonic plates thereof."
  Dr Arunachalam Kumar, professor of anatomy, Kasturba Medical College, Mangalore,

Karnataka, India,
December 4 2004 (Michael McCarthy: "Did whale beaching foretell disaster?" February 2 2005)

Toads may show sensitivity to changes in electromagnetic energy through changes in breeding patterns before earthquakes:

"Our study is one of the first to document animal behaviour before, during and after an earthquake, It was a serendipitous thing that happened. One day there were no toads. I was actually very annoyed. I thought my research was all going down the drain. And the earthquake happened, and then they all started coming back the day after."
Rachel Grant, Open University, Milton Keynes, England, 2011

Common toads (Bufo bufo) showed a dramatic change in behaviour five days before an earthquake shook L'Aquila, Italy in April 2009. Grant and her colleague found the toads abandoning spawning days before the shaking started. She has been studying frog reproduction during the lunar cycle for four years, and was at a site 74 km from the epicentre of the quake with her assistant between the new moons of March and April. This meant they were watching the 'seismic toads' before, during, and after the magnitude 6.3 event. Male toads usually stay at the breeding sites until spawning is complete, but 96% them abandoned the pool five days before the quake and numbers remained low until 10 days afterwards. The number of amplexed pairs—where males grasp females tightly with their arms—declined to zero just three days before the earthquake and stayed low until the last aftershock.
(Janet Fang: "Toads 'predict earthquakes'" Nature.com, March 31 2010)

One suggested mechanism is ionization of the air at the ground-to-air interface where positive airborne ions cause changes in stress hormone levels in animals and humans. Another mechanism is the electric field and current induced in the animal as it passes through the magnetic field, or where a change in the magnetic field induces an electric field in the organism. It has been shown that magnetic fields of below 10 nT, well below the Earth's background magnetic field, can induce these currents and thus cause biological effects in sensitive animals. Some relevant studies:
Kirschvink JL, 1982; Klinowska M, 1985; Kirschvink JL, 2000; Grant RA et al, 2011; Berberich G et al, 2013; Freund FT et al, 2013; Fidani C et al, 2014; Yamauchi H et al, 2014

- Disturbance of natural electromagnetic environment:

ants' foraging and avoidance nest location (Cammaerts MC et al, 2012) (Cammaerts MC et al, 2014)m

bee foraging and failure to return to hive, perhaps related to colony collapse disorder (Liang CH et al, 2016).

birds unable to adapt to RF fields (Wiltschko R et al, 2015).

mice nesting show clockwise shift (Malkemper EP et al, 2015).

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- Biological Mechanisms:

Most of the mechanisms and pathways established for human Electromagnetic Sensitivity were first shown for animals such as rats and mice (see: Science - Mechanisms)

Bees detect electric fields using mechanosensory hairs (Sutton GP et al, 2016)

Two different magneto-reception systems have been proposed for bird and fish navigation:

- bio-magnetite

- cryptochromes

- or possibly MagR, a protein combining both (Cyranoski D, 2015)

Marine sensitivity

The latest studies indicate that much marine life is sensitive to man-made electrical and sonar pollution.

1. There are three main sources:

(a) Cathodic currents used to slow marine corrosion on metal hulls of ships, pipe-lines, oil platform rigs, marine wind turbine installations, floating platforms.
(b) Microwave pulsed microwave radiation from ship and shore radar and communications.
(c) Sonar detection from military and fishing ships.

2. The effects on marine life include the following.

(a) Coral reef corrosion or oxidation, where calcium (a mineral or metal) carbonate structures are especially affected.
(b) Fish and cetaceans, which can be overheated by, for instance, lock-on radar systems.
(c) Fish and cetaceans, which can be adversely and cumulatively affected by low-level electrical currents induced by radar and radio frequency transmissions,
(d) Divers if not wearing dry suits, where approaching within 3,000 feet of a ship can cause cardiac arrest.

- Jeff Centaurid: "On the brink radio, no.178: Stewart Simonson (3) 'Marine electrification scenario'" (SoundCloud, November 10 2016, 59 minutes)
- Chris D'Angelo: "26 Countries Gather In Hawaii For Massive War Game" (Huffington Post, June 28 2016)

- Jessica Else: "Military and Marine Life: PMRF, researchers meet to discuss possible effects of base's activity on coral, other sea life" (The Garden Island, April 3 2016)
- Jim Mendoza: "Military exercises in Pearl Harbor may impact garage doors" (Hawaii News Now, 2014)
- Stewart Simonson "Evidence for increased coral bleaching and disease from accelerated marine corrosion due to electromagnetic pollution and induced stray electrical currents in seawater" (2015)
- Ramsay Wharton: "25K military personnel converge in Hawaii for RIMPAC war games" (Hawaii News Now, June 24 2016)

Animal sensitivity

1. Animals best suited to formulate EM exposure limits

Because animals are more easily studied objectively than humans, it has been suggested that their sensitivity could be used for formulating biological safety limits. This could be true for the Fruit Fly (Margaritis LH et al, 2014).

2. Animal Electromagnetic Hyper-Sensitivity

A growing number of anecdotal reports show that the there are variations in the degree of sensitivity to electromagnetic exposure displayed by animals, just as there are among humans. This is an inevitable consequence of biological diversity even with a single species, including genetic variants and differences in diet, habitat and behavior. People with Electromagnetic Sensitivity often report that their pet cat or dog, if the animal is particularly sensitive to electromagnetic exposure, prefers to find an area of the house or yard for sleep which the use of an electronic meter shows is the area with the lowest level of electromagnetic pollution. Similarly, an especially sensitive pet avoids typically avoids areas with especially high electrosmog.

Need for new radiation limits to protect wildlife

Since wildlife is affected as much as humans by the high levels of man-made radiation on Earth, new biological non-thermal safety limits are needed to protect wildlife as well as humans.

- Albert M. Manville: "A Briefing Memorandum: What We Know, Can Infer, and Don't Yet Know about Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife" (2016)

Solar Biological Effects

For hundreds of years it has been known that plants in particular show responses to solar electromagnetic events, such as the sunspot cycle. These effects are more difficult to detect in humans, but attempts through chronobiology often show similar patterns (Hrushesky WJM et al, 2011).

Lunar Biological Effects

A potentially important theory has recently been proposed (Bevington, 2015), that some lunar biological effects, which have been established since ancient times for most plants, some animals and some humans, may relate to variations in electromagnetic exposure at the phases of the lunar Full Moon at night, or at New Moon's lunar wake in daytime. If confirmed, this would explain many plant and animal observations, in addition to human behavioral and medical changes among those especially sensitive to electromagnetic exposure.

http://www.electrosensitivity.co/science--plant-and-animal-electromagnetic-sensitivity.html

Will We All Become Electrosensitive?

Each year an increasing number of people claim to suffer from electrosensitivity (see, e.g., compilation of references given in Table 1), also known as being electrically hypersensitive (EHS). There are also other diseases, such as fibromyalgia and burn-out syndrome, that have symptoms similar to those exhibited by people suffering from electrosensitivity. In Sweden, electrosensitivity is recognized as a handicap, but there is still controversy surrounding the diagnosis of the disease. The mainstream view by governmental and medical authorities is that this handicap is a psychological phenomenon with no basis in physical or medical mechanisms (Swedish National Board of Health and Welfare, SNBHW, 1995), whereby perpetuating the misconception that only a small fraction of the population is concerned about electrosensitivity or the proximity of new radio transmission masts. The number of reported cases of electrosensitivity has been steadily increasing since it was first documented in 1991. Data presented here are estimates and are based on large sample inquiries where different sets of questions have been used. To determine whether the statistics indicate a sub-population of electrosensitivity or if the total population is at stake, we plotted reported prevalence estimates over time in a normal distribution diagram (Table 1 and Figure 1). Contrary to the views of mainstream medical authorities, Figure 1 shows that the group of electrosensitive people around the world, including Sweden, is not just a small fraction that deviates from the rest of the healthy population. Instead, it points at the possibility that electrosensitivity will be more widespread in the near future. The extrapolated trend indicates that 50% of the population can be expected to become electrosensitive by the year 2017.

http://www.next-up.org/pdf/EHS2006_HallbergOberfeld.pdf

Corded or cordless: have you made the connection?

This weekend, I'm going out to dinner. Hardly cause for a blog, you might say—or even a Facebook status update, given that most people go out for dinner several times a month or week. For me, though, it's a rare event. In fact, I haven't had dinner at a restaurant or a friend's place for over two years. It's not because I can't eat. (Boy, can I eat!) It's not because I haven't been invited out, either. (I do have friends.) And it's not because I'm broke or have BO. No. The reason I haven't been out is because there's Wi-Fi everywhere, generating harmful radiation that affects me so badly I can barely function. And it's not worth the risk of getting another brain tumor, no matter how good the food is.

This time, we're going to a friend's place—a friend who has shown himself to be exceptionally caring and considerate. He has offered to switch off his Wi-Fi when we arrive and even asked his neighbor if he'd be willing to do the same, if necessary. The neighbor agreed, and I love them both already. To be sure that our friend's home was radiation-free, however, my man Lewis took my gauss meter and went to check the place out. (I love my man, too …and it seems to me that a lot more loving happens when Wi-Fi is turned off.) He was surprised to find that the levels of radiation were sky-high. Yet the Wi-Fi had been switched off, so where was it coming from? It wasn't from a Smart meter and it wasn't coming from the neighbors' place.

It turned out that it was coming from a cordless phone system. Our friend has three cordless phones in his house, and they were emitting shockingly high levels of radiation—*500 times higher* than the radiation from a Samsung cell phone (known for its particularly strong signals). When the base unit was unplugged and the handsets disabled, the meter readings dropped down to minimal levels.

If you have a digital enhanced cordless technology (DECT) phone in your house, you're almost certainly being exposed to far more radiation than your system can tolerate, over time—and you may be unaware of how it's affecting you. Some people are concerned about the radiation from their cell phone, but few ever think about cordless phones, which are far more harmful. These phones emit the same type of pulsed microwave radiation as cell phones, but they never 'power down'. They are always transmitting and the pulses they emit are far more aggressive than those used in cell phones. With long-term use, cordless phones have been found to increase the risk of brain tumors, including acoustic neuromas—previously considered to be rare. (My hubby tells me I'm one in a million, but even I got one of these growths, which are rapidly becoming common.) Several studies of analogue cell phone, digital cell phone and cordless phone use have revealed that all three types of phones were linked with increased tumor rates. Research by Swedish scientists confirms that the risk of cancer is greater for those who use either DECT cordless phones or cell phones—and even greater for those who use both.

A German medical physicist and researcher at the University of Luebeck, Dr. Leberecht von Klitzing, has researched the biological effects of DECT systems. He took blood samples from children who had cordless phones in their homes and found that the red blood corpuscles did not mature properly, resulting in listlessness and/or aggression, pallor, sleeplessness and many other symptoms—all of which could be reversed when the phones were removed.

According to Lloyd Burrell of electricsense.com, we'd do well to follow the advice of respected Harley Street physician, Dr. David Dowson, who says: "Having a cordless phone is like having a mobile [cell phone] mast in your house. I'd recommend anyone who has one to switch to a plug-in phone."

Yes, it's inconvenient. If you use a corded phone, you won't be able to walk around the house while you're on a call. You might actually have to sit down and focus on the conversation, rather than doing the laundry or making dinner as you talk. But I can tell you from personal experience that it's far, far less inconvenient than having brain surgery, which can cramp your style in unimaginable ways.

According to Dr. Magda Havas, an expert in electromagnetic radiation who petitioned for first-generation DECT phones to be banned in Canada, serious health effects occur near DECT phone base units. "[A]t a distance of just beyond 3 meters from my DECT phone base unit (according to studies of RF radiation)," she says, "EEG brain waves are altered. At 2.8 meters, motor function, memory and attention of children are affected. At 1.7 meters, sleep is disturbed. At 30cm, memory is impaired and, at closer distances, the immune system is affected, REM sleep is reduced, insulin levels drop, and there are pathological changes in the blood–brain barrier. Studies also show that there is a 100% increase in adult leukemia between 45 and 130cm from the phone and a similar increase in childhood leukemia between 35 and 260cm."

Havas also reports that studies of 356 people, exposed long term to high-frequency pulsed electromagnetic fields associated with DECT phones and/or cell phone base stations, revealed a disturbingly long list of effects.

The following symptoms increased with greater proximity to the phone base:

- sleep disturbance, fatigue, depression
- headaches, restlessness, irritability
- mental confusion, difficulty concentrating, forgetfulness
- learning difficulties, trouble finding words
- frequent infections, sinusitis, lymph node swellings, allergies
- joint and limb pains, nerve and soft tissue pains
- numbness or tingling
- tinnitus, hearing loss
- giddiness, impaired balance
- visual disturbances, eye inflammation, dry eyes
- tachycardia, episodic hypertension, collapse
- hormonal disturbances, thyroid disease
- night sweats, frequent urge to urinate
- weight increase, nausea, loss of appetite
- nose bleeds, skin complaints
- tumors and diabetes.

Many of these symptoms are now associated with the rapidly growing phenomenon of electromagnetic hypersensitivity (EHS), and they're a healthy, normal reaction to an invisible threat.

Because DECT phones are so powerful and because the radiation instantly passes through walls, you can be exposed to this radiation even if you don't own a DECT phone …but your neighbors do.

http://olgasheean.com/corded-or-cordless-have-you-made-the-connection/

Electromagnetic Hypersensitivity, It is real!

Wikipedia continues to categorize Electromagnetic Hypersensitivity as "pseudoscience." Ask these people if this is all in their head. Especially, the children's stories that are posted on this page. There is nothing that is "pseudoscience" about this! Plus a medical code, though it is not billable, exists in the ICD10 as **W90.0 Exposure to radiofrequency** which is under **W90 Exposure to other nonionizing radiation** and here is a camera photo of the ICD10 Manual.

Cell Phone Victim Testimonials

1. **Tiffany Frantz** - At the age of 21, developed breast cancer in the exact location of where she kept her cell phone. In fact the images of her cancer outline the exact size of her phone on her chest and how it laid upon her. Watch her story at: https://youtu.be/ZWN838VCUv4.
2. **Attorney Jimmy Gonzalez** - Please do not forget Attorney Jimmy Gonzalez from Florida who died of three cancers all related to where his cell phone was. Here is his testimony at https://youtu.be/lzOjK6PHUas.
3. **Matt Huck** - You can read the 20 page story at http://truthandfactsneverlie.info/blog/my-full-story which is downloadable at the bottom in PDF format.
4. **Donna Jaynes** - At the age of 38, she developed breast cancer exactly where she kept her cell phone. Watch her story here: https://youtu.be/BJib5GHxOsE.
5. **Alan Marks** - He won a lawsuit that enabled the city of Berkeley to warn cell phone users from his experiences of having a cell phone for over 20 years. A brain tumor specialist in Sweden remarked how Alan was "the poster boy" for people about the increased risk of one developing cancer due to their prolonged cell phone activities. His story available at http://www.jweekly.com/article/full/58831/cancer-calling-east-bay-couple-on-a-mission-to-warn-of-cell-phone-risks/
6. **Paul Prischman** - He died at the age of 42 due to a cell phone induced cancer. Listen to his widow at https://youtu.be/aBwk4WbM6CA

Cell Phone Tower Victim Testimonials

1. **Eileen O'Connor -** One of the victims of the Wishaw mobile phone mast and the cancer cluster tower. Here is a copy of her presentation: http://www.radiationresearch.org/pdfs/eileen_my_story.pdf. Her information is available on cell phone masts; http://www.radiationresearch.org/campaigns/mobile-phone-masts
2. **Fairfax County, Virginia Children -** These children ask to stop a cell tower from being put up in their playground. Video link is: https://youtu.be/dEDxOBZhZwY
3. **A woman's story about rooftop antennas –** She shares her daughter's and her story at: https://youtu.be/-G3CWrgDS5E

Smart Meter Victim Testimonials

1. **Connie -** Watch her story about smart meters at: https://youtu.be/3TIRwrR0llE
2. **Sandy Aiders -** Her husband and she suffer from being harmed by smart meters. Watch Sandy tell their story at: https://youtu.be/1zzRP_J7P-c?t=3m32s

Wi-Fi Victim Testimonials

1. **Teenagers and Childrens testimonies to Wi-Fi –** Watch that here: https://youtu.be/jvkxO8xLqMQ
2. **Jenny Fry -** At the age of 15, she committed suicide because no one would support her with her realization that Wi-Fi at her school was the cause of her problem. Did the medical field help or investigate, NO! Her story is at http://www.dailymail.co.uk/news/article-3339511/Schoolgirl-15-hanged-developing-allergic-reaction-Wi-Fi-school.html
3. **Sixth Grader -** This girl's comments can be watched at: https://youtu.be/E7oj-ZXBAF4?list=PL2TxgdaZ0lgDyO6MdGnBQrNG7pfs8fKOW
4. **Student at Onteora School District -** This student talks about their health at: https://youtu.be/6Z3d8FxFhQk
5. **Student Story -** Here is a video of a female student: https://youtu.be/tNpKShvxar0?t=45s

Electromagnetic Hypersensitive Testimonials - Microwave Sickness Testimonials

You can call it what you want, but these people below suffer just like the ones above. They give it a name, it's "Electromagnetic Hypersensitivites" however the German's in the early 20th Century called it "Microwave Sickness." Once your life has been destroyed by man-made radiation, there is no "cure all" fix to make things the way they were before. You can do things to ease the pain, even put a Band-Aid fix on it. However, this does not cure it but will only help make you feel that you are almost whole once again. Please respect the "canaries in the coal mine."

1. **Candy -** Her comments can be seen at: http://time.com/golden-cage/
2. **Reverend Carsten Häublein -** He committed suicide after suffering from wireless radiation and after ten years of suffering took his own life. His story is at http://ehsfighback.blogspot.com/2014/02/when-priests-commit-suicide.html
3. **Sarah Riley -** Her story is available at: https://youtu.be/1zzRP_J7P-c?t=9m40s
4. Andrew McAfee – His story is available by watching "Search for a Golden Cage:" http://time.com/golden-cage/
5. **Dafna Tachover -** Take part in her journey to find a place of residency due to being harmed by technology. Watch at: http://time.com/golden-cage/
6. **David Wientjes –** David's wife and David started having symptoms to wireless radiation from antennas put up near them. Watch his comments at: https://youtu.be/1zzRP_J7P-c?t=57s.
7. **Silvia Wilson -** She moved across the Atlantic Ocean to find relief. Her story is available at; http://www.bbc.com/news/uk-england-lincolnshire-21386477
8. **Jennifer Wood -** Hear her story at: http://time.com/golden-cage/

Supporter Testimonials

1. **Virginia Farver –** She lost her son Rich Farver at the age of 29 to glioblastoma multiforme (GBM) brain cancer on October 11, 2008 which was a direct consequence of having a cell phone. This cancer was in direct location of where Mr. Farver held his cell phone. Story can be found at We Are The Evidence.
2. **Traci Frantz -** She is the mother of Tiffany Frantz, who at the age of 21, developed breast cancer in the exact location where she kept her cell phone. In fact the images of her cancer outline the exact size of her phone on her chest and how it laid upon her. Watch Tiffany's story at: https://youtu.be/ZWN838VCUv4

http://truthandfactsneverlie.info/supporters-victims

Further Testimonials & Stories

Direct Testimony of Joshua Hart

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

***Case No. 15-00312-UT**, 7/11/2016*

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR PRIOR APPROVAL OF THE ADVANCED METERING INFRASTRUCTURE PROJECT, DETERMINATION OF RATEMAKING Case No. 15-00312-UT PRINCIPLES AND TREATMENT, AND ISSUANCE OF RELATED ACCOUNTING ORDERS

PUBLIC SERVICE COMPANY OF NEW MEXICO,

Q. Please state your name and address.

A. Joshua Hart, Post Office Box 682 Portola, CA 96122

Q. Briefly state your occupation, educational background and current employment.

A. Currently I am Director of Stop Smart Meters!, an organization fighting the forced deployment of utility meters that harm health, violate civil liberties and endanger public safety. I have worked in the energy industry, as an urban and transportation planner, environmental advocate, and freelance journalist. I obtained my MSc in Transport Planning in the UK at University of West England, Bristol in 2008, and completed research entitled *Driven to Excess*, presenting the social and quality of life impacts of car traffic on local residents. The research was covered in over 100 international media outlets including the *BBC*, the *Guardian*, *Tehran Times*, and the *Daily Mail*. Part of this work included the creation and implementation of a series of surveys and questionnaires. I have been interviewed by PBS Newshour, as well as hundreds of other local and national news outlets. My writing has appeared in *the Wall Street Journal, Surveyor Magazine*, *Walk Magazine*, *Make Magazine*, and Lonely Planet's anthology *Flightless: Incredible Journeys without Leaving the Ground*. Attached as Exhibit A is a copy of my CV.

Q. Briefly describe your professional experience.

A. I have worked for a number of professional health and environmental advocacy organizations, including the Rails-to-Trails Conservancy, San Francisco Bicycle Coalition and a UK-based pedestrian advocacy organization called Living Streets. Since 2010, I have been director of California-based Stop Smart Meters! I have studied the relevant literature regarding aspects of the current "smart grid" deployment including studies on RF health and environmental impacts.

Q. Have you authored any papers or journal articles?

A. I carried out a master's dissertation between 2007-2008 at the University of the West of England entitled *Driven to Excess: Impacts of Motor Vehicles on the Quality of Life of Residents of Three Streets in Bristol UK.* A journal article based on the research results was published in June 2011 in Volume 17.2 of *World Transport, Policy and Practice.*

Q. Briefly describe your work and experience related to the study of electromagnetic fields and radio frequency ("RF") waves in the 30 MHz to 300 GHz range, as related to smart meters.

A. As a grassroots journalist and advocate, I have investigated hundreds of cases of reported health and environmental impacts of smart meters. I have also read hundreds of scientific reports on the subject and attended multiple workshops, public forums, and conferences regarding RF, electromagnetic fields, and health.

Q. In your role as Director of Stop Smart Meters! have you obtained information confirming that utility customers have been injured by smart meters?

A. Yes. I have personally interviewed, read first person accounts and listened to first and second hand accounts of smart meter victims suffering from a wide range of health effects from mild to severely debilitating. I am familiar with well over twelve hundred such accounts that have been documented. Many of these victims became sick before they knew a smart meter had been installed either on their home or in their neighborhood. Many didn't even know what a smart meter was before they were injured. Some of these people have become so sensitized to RF that they have been forced from their homes

because of proximity to area meters and other wireless infrastructure or have been forced to leave their jobs because of RF in the workplace. For many people who have become sensitized to RF, they have remained so even after the removal of the smart meter. It is astoundingly clear that smart meters can cause illness and that lasting sensitivity to RF can result from instantaneous exposure and/or chronic exposure over time.

Q. Have you obtained information about smart meters being implicated in house fires and appliance failures and fires?

A. Yes. Thousands of such fires, explosions, and electrical problems have been reported over the past 6-7 years. We have reported on a number of such fires and electrical faults on StopSmartMeters.org. A series of 26 smart meter fires forced Peco Energy in Pennsylvania to halt their smart meter deployment in August 2012. Hundreds of thousands of smart meters have been recalled, across several US states and Canadian provinces due to fire safety problems.

Q. Have you gathered accounts of illness from smart meters and if so please describe how?

A. Yes, Stop Smart Meters! has collected complaints about smart meters related to RF health impacts, fires, overcharging, and other issues since October 2011. We worked with a web professional who volunteered to design and manage the website http://smartmeterhelp.com. Results of online surveys came in from all over the country, were entered into a SQL database, and complaints from California periodically forwarded to Governor Jerry Brown, the customer's utility company, the California Public Utilities Commission, and the California Department of Public Health, who set up a special e-mail address to receive smart meter health complaints. More than 1400 written complaints in total were received. A significant percentage were health complaints. The attached declarations (Exhibits B) were received in response to an email request to those complainants who entered an electronic complaint at smartmeterhelp.com.

Q. Are the attached Exhibits B true and accurate copies of the declarations received by Stop Smart Meters! from people who had responded to your online survey?

A. Yes. I have reviewed each of the attached declarations. They are all true and accurate copies of the declarations received by Stop Smart Meters!

Q. Is there anything else you would like the Commission to know?

A. Given the strong peer-reviewed science now linking wireless radiation to disease, and given my own firsthand experience, a policy decision to blanket entire New Mexican communities with smart meters and associated infrastructure poses a serious threat to public health and safety. Particularly relevant are the results of a recent study from the National Toxicology Program which found significant 3 levels of DNA damage, and brain and heart cancer in rodents exposed to ambient RF— of a similar type to that emitted by wireless utility smart meters. This is consistent with the smart meter health complaints we have received. In areas of RF safety, privacy, fair and transparent billing practices, national security, efficiency and fire safety, basic electromechanical analog meters remain superior.

EDUCATION

MSc Transport Planning
June 2008
University of the West of England, Bristol

Bachelor of Arts in Psychology
Minor in History, June 1998
University of California at Santa Cruz

EMPLOYMENT

Director, Stop Smart Meters! StopSmartMeters.Org July 2010- present

• Educated the public about the health, safety, and privacy impacts of digital "smart" meters, through broadcast, print, and online media
• Provided technical assistance to dozens of groups and individuals opposing the smart grid and organizing locally
• Interpreted the science on biological effects of wireless for the public benefit

Consultant, San Francisco County Transportation Authority May 2006 to August 2007
• Researched environmental impacts of automobiles to inform a proposed shift from auto level of service (LOS) to auto trips generated (ATG) as an environmental review threshold
• Collaborated with colleagues to identify strategies to bring San Francisco's environmental review processes into line with latest knowledge on environmental impact of automobiles
Program Director, San Francisco Bicycle Coalition January 2003 to April 2005
• Initiated and ran SFBC's BikeEd Program, based on the League of American Bicyclists BikeEd curriculum, teaching safe cycling skills to thousands of adults citywide.
• Organized members and allied community groups to support improvements in the City's bicycle route network, as well as changes in policies to support greater levels of cycling, testifying at dozens of City Hall hearings and meetings.
• Ran publicity campaigns to educate motorists and cyclists on safe roadway sharing
CA Project Coordinator, Rails-to-Trails Conservancy January 2000-June 2002
• Provided in-depth technical assistance to a variety of local advocacy organizations and public agencies around California working on rail-trail conversions
• Gave presentations to elected officials and community groups about the benefits, proper design, and management of public trails and on-road bicycle and pedestrian facilities
• Organized statewide legislative trail advocacy day in Sacramento to support the efforts of dozens of organizations engaged in trail policy development
• Researched and authored Tunnels on Trails, a study of 78 bike/ pedestrian tunnels in the United States (2001) as well as The Mission Creek Bikeway Concept Plan (2002)
Energy Sales Coordinator, Green Mountain Energy June 1999- December 1999
• Negotiated partnerships with retail outlets in San Francisco, Oakland, San Diego, and Santa Cruz as part of the California storefront tabling program
• Trained/ managed Field Consultants in sales strategy, environmental policy, and data concerning climate destabilization, energy use, and transport
League Cycling Instructor, League of American Bicyclists June 1998-June 2006
• Underwent intensive teacher's training program (both on and off road) and became accustomed with strategies for teaching the leading US cycling curriculum
• Organized, planned, and taught BikeEd classes to community groups and businesses with an emphasis on the environmental benefits of decreased auto dependence
ADDITIONAL SKILLS
• Attended Spin Project media training course, which advised on media strategy for charitable organizations San Francisco April 2004
• Extensive experience dealing with television, radio, and print media concerning a range of cycling, environmental, and climate messages

Another testimonial provided by Joshua Hart, MSc can also be found here:
http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/01/Exhibit-11-Hart-Web.pdf

Collateral Damage: Speaking Out Against Wireless Harm

The following is an anonymous testimonial from a sufferer of electromagnetic hypersensitivity:

For those of you obsessed with your wireless technology, I need to ask–why are my children and I considered acceptable collateral damage so you can have your wireless convenience? Have you utterly lost your sense of humanity? Maybe you don't feel any health effects (yet) from this technology, but many of us do–millions of us–and we are suffering. Do you not care? I want to know why you don't care. I want to know why your wireless gadgets are worth more to you than my children's health or my health or our lives. What in God's name is so important about your texting that we have become inconsequential?

You wouldn't force a child who is allergic to peanuts to live in a home filled with peanuts, would you? Would you force a peanut-allergic child to endure such a potentially deadly assault on their immune system? But Super Wi-Fi, smart meters, Wi-Fi, etc. are essentially doing just that to people like us who are sensitive. Perhaps you don't acknowledge the problem because the radiation is invisible (you can at least SEE peanuts). Yet we are being bombarded by toxic radiation everywhere we go, whether we like it or not–and we have become inconsequential because you want what you want: your wireless convenience. I want to know why–even if you are seemingly unaffected by this technology–I want to know why you don't care about those of us who ARE affected.

I want to know why you think it is okay for me to get severe migraines every time I have to go into a public place that uses Wi-Fi. Nowadays, that means a debilitating migraine nearly every single day. I want to know why you think it is okay for my child to be drowning in his own mucus and struggling to breathe because his immune system goes berserk when he's exposed to this radiation. I want to know why you think it is okay that my other child has profound memory loss, insomnia, and can't think straight due to these frequencies. Or didn't you know that pulsed microwave radiation (now classified as a Class 2B carcinogen) causes these symptoms??? Well now you know, and according to experts nearly 35% of the population (50% by 2017) is in the same boat as us with these or other symptoms (although most don't even know what's making them sick). I want to know why you are not speaking out on our behalf. Because now that you know, there is no excuse. You are, by your silence, saying it is okay for us to suffer. Please tell me how to explain to my children that you having wireless convenience is more important than their health or their lives. Please tell me as a mother how to cope with watching my children needlessly suffer. Try to put yourself in my shoes.

I don't care if this technology is "popular" or if "everyone is using it"; this is not okay. It is not okay to say "well it's not going away so you'll just have to live with it." Many of us who are sick from this radiation are now too ill to speak out. Many of us struggle just to find a safe place to live, shop, or go to school. We can't even safely go to a doctor or a hospital without getting seriously ill because of Wi-Fi exposure. There are electrosensitive people living in tents in the mountains and the deserts of our country because they can't live anywhere else due to the amount of radiation in our communities.

I post info on this subject all the time. Some of you read it (thank you if you do), but I'm sure many of you don't bother because you're not affected (yet) or you haven't figured out that your health problems are being caused by it. Or maybe you just don't want to hear it because you love your wireless gadgets so much. But what about those of us who are fully aware this technology is making us sick? Do we not

matter to you? Maybe it's just easier for you to think we are imagining it. Well if you think you're not affected, think again.

I don't know about you, but I'm sick and tired of kids dying from leukemia, cancer, and brain tumors (are they perhaps sitting underneath a wireless access point at school? using a cell phone themselves? or just frying in Mom or Dad's car while the parents use their cell phone?) Now, appallingly, I see parents giving their toddlers smartphones to keep them busy and help them "get through the day." I am sick of cell towers going up outside schools and residential neighborhoods. I'm sick of Distributed Antenna System (DAS) units (the equivalent of a cell antenna) being installed on the telephone wires right outside people's bedroom windows–and they don't even know because the radiation is invisible.

I'm disgusted by the number of children being drugged for "ADHD" and "behavior problems" (how can they think or behave properly when bombarded by whole-body radiation from Wi-Fi at school???) I'm sick of getting yet another phone call that my sister, my cousin, or my friend has breast cancer (oh that's right, they have a wireless digital utility meter on their house, Wi-Fi in their home/office, and/or they use a cell phone). I'm tired of hearing about my friends' husbands dying from kidney and bladder cancer (can you say laptop???)

I want to know where all the bees have gone (they used to be EVERYWHERE when we were kids). I want to know how the hell we're going to grow food if all the pollinators are dead! I'm tired of flocks of birds dropping dead out of the sky, and millions of bats (also pollinators) dying of mysterious fungal diseases (the immune system cannot function properly in the presence of these frequencies). If you think you're not affected by all this, please think again.

Please care enough to acknowledge that this technology is essentially free license to commit genocide in slow motion against those of us who cannot tolerate these frequencies. And you or your child may be next if/when your body can't tolerate it anymore either. So please have the moral fortitude and common human decency to do something about it, because those of us who are getting sick from it can't do it alone anymore. We need your help. The problem has gotten too big and soon there will be no escaping it (Super Wi-Fi is on its way). If you are truly a human being, start acting like one. Please don't accept what is happening to your fellow human beings. Please care about me and my kids and others like us. Please care about those who are being affected and don't even realize it yet. Please do something about this.

It is not okay to essentially cripple and/or kill off an entire segment of the population for the sake of wireless convenience. We, as a species, should be better than that.

http://stopsmartmeters.org/2012/02/29/collateral-damage-speaking-out-against-wireless-harm/

On the run …from the silent, invisible foe

I'm on the run—a fugitive, darting furtively from one safe house to another. When I dare to go out, I cover my face and as much of my body as I possibly can. I've become invisible, silent and stealthy. I haven't been seen out in public for a long time. Think about it: when was the last time you saw me out there, in person, openly socializing? Exactly. See what I mean?

I'm trying not to let it get to me, trying not to get paranoid and start imagining things that aren't really there, on top of what I know is there. Who am I fleeing? No one. What crime have I committed? None. Yet I'm on the run from the biggest, stealthiest, most insidious take-over of all time. And I'm all alone. The corporate giants hold all the cards and the government won't help. They know I've figured out what's really going on, but they don't want anyone else to know. There is nowhere safe for me to go and no safe way for me to get there.

Sometimes, when I'm dehydrated and desperate for some human contact, I slink into a café for a drink. But then my heart starts to pound, my whole body breaks into a sweat, my head throbs, I feel dizzy and I get the shakes—not milk shakes, just plain old body shakes. People are looking at me and reaching for their phones …and suddenly everyone feels like a threat. It's as if they've all become part of some unspoken conspiracy and there's no one I can trust. I've barely drunk my fizzy water but I have to leave.

This has been going on for a while—over two years—and I'm running out of stamina and safe places to hide. It's taken a toll on my health, aging and debilitating me. My nervous system is in perpetual 'fight or flight' mode, and I'm unable to relax, rest or be at peace. I've hardly any friends left, and I can't remember the last time I went to a restaurant, the movies or a dinner party. I'm a recluse and a social pariah, and I doubt that more than a handful of people will miss me if I disappear.

I've tried fighting back, but the enemy is slippery, skillful and beyond my reach. It's protected and sanctioned by the powers that be, and I'm just a little person—someone they can easily quash. I'm taking legal action, but even the courts are in the pockets of these predators, and their legal 'experts' have been won over with misinformation and political spin.

There are others like me, but we're widely dispersed, so it's hard to muster a force strong enough to make an impact. Plus, like me, they're tired of fighting for what's right. I can see why some of them decided to take their own lives. I've considered it—not because I feel suicidal, but because it feels as if there's nowhere left for me to go. I feel cornered, surrounded, stuck in a cycle of diminishing returns.

Yet I refuse to be a victim and I won't go down without a darn good fight. In fact, I'll fight and not go down. I know I'm being challenged to find a powerful solution. I'm smart, creative and good with words, and I've done some interesting stuff in my life—for WWF International and the United Nations in Switzerland. I've published books, been on TV and radio, been featured in local and national newspapers, and have helped others find their own powerful voice. I've written about the deeper truth of what it means to be human. But the truth is not enough, it seems, and I'm running out of time.

If anyone reads this, what will they think? That I've lost my marbles? That I'm some kind of conspiracy nut with an axe to grind against the establishment?

You can look me up, if you're curious. It's so wonderfully easy to do that, these days. Just touch-and-type and all the information in the universe is at your fingertips. But when you reach for your iPhone, think of me. When you're in the elevator with half a dozen other people with their heads down, when

you're pressed against other intently texting bodies on the bus, or when you're e-mailing while walking down the street—think of me being on the run …from the 20-foot aura of radiation coming from your phone, extending all around you, instantly penetrating cement, metal, plastic, clothing, cars, skin, muscles, tissue and bone, damaging red blood cells within minutes, causing cellular leakage of calcium, killing neurons, inhibiting your brain, reducing your libido, affecting your memory, disrupting your sleep cycles, and slowly chipping away at your health without you ever feeling a thing.

And you probably won't feel a thing, until the damage is done (and even then you'll blame it on everything but your phone). I was just like you—loving my electronic gadgets and blissfully oblivious to their effects …until I got a brain tumor. But I sure am feeling it now.

So, think of me when you're on your phone, and remember that you're just like me—with the same red blood cells, the same nervous system and all the other bodily bits that react exactly as they're meant to, when exposed to electromagnetic radiation. If I can get a brain tumor, so can you. It may be hard to accept, but death doesn't just happen to other people, while you're busy texting.

I'm leaving, now—heading off to a teepee in the forest so my body can reconnect with the earth and (hopefully) bounce back. Like so many others reacting to all this radiation, I'm being forced to disconnect. But if you're committed to non-stop wireless living, you're already disconnected—from the deeper truth about the damaging effects, from your body's subtle messages, and from the changes already taking place inside you, masquerading as fatigue, stress, ADD, insomnia or other seemingly 'normal' ailments—as well as the far more disturbing neurological conditions, autism, dementia and infertility that are now affecting so many people. You simply haven't yet connected the dots.

I have special radiation-shielding fabrics to protect me when I go out. But the only reason I need to cover up is because of the corporate cover-up. You're not getting the facts. And the cell phone companies and Internet service-providers are not your buddies. Intent on keeping you addicted to your gadgets (and too engrossed to connect any of those dots), they will happily collude with you in your denial of the dangers.

But the body—that delicate electrical system that can't be upgraded or replaced with the latest technology? The body never lies.

http://olgasheean.com/on-the-run-from-the-silent-invisible-foe/

My Life Living 6 Feet Under Cell Phone Towers

If you told me three months ago not to hold a cell phone to my head or body, and that if I did, to at least have the battery pack facing outwards, I would have listened but it would not have changed my mind. If you told me to exchange my cordless phones for good old-fashioned corded phones, I would have listened, but it would not have changed my mind, I liked my cordless phones thank you very much. If you told me three months ago to use an Ethernet cable with my laptop and keep Airport mode turned off, or to move the Wi-Fi antennae from my bedroom and to turn it off at night or when not in use, or to get rid of all Wi-Fi all together, I would have listened, while thinking to myself "that's a lot of work, why would I want to do all of that?" If you told me thee months ago that baby monitors should not be placed near babies or to ask my 14yr. old daughter to text more than talk, and not sleep with her phone or computer on the pillow beside her, I would have listened but still it might not have changed a thing. If you told me three months ago that the microwave radiation emitted by cell phones, cordless phones, Wi-Fi antennas, cell towers and masts, WLAN and other wireless technology was an invisible culprit causing thousands of people to experience all manner of symptoms from insomnia to high blood pressure, and should be avoided completely or at least whenever possible, I would have listened, but still I might not have changed a thing. After all, the government was there to protect our health and they were approving these things, and the mass media told all of us these devices are safe to our health. But before three months ago I hadn't spent more than a month living 6 feet under as well as in front of cell towers that were placed on my balcony roof. Before three months ago I was healthy, vital and slept like a baby. I didn't wake up with numb hands and feet, my body feeling prickly all night and tingling or vibrating almost all day. I didn't spend night after night in a hyper active state, as though electricity was running through me. Before three months ago I lived in a beautiful home that I loved, it was my sanctuary. I didn't have a hissing or buzzing or high-pitched ring in my ear, known as tinnitus or microwave hearing, mostly when in that home. I didn't get tension headaches ever, or feel like there is an invisible band around my head creating pressure. I didn't feel bouts of nausea on a regular basis, sometimes accompanied by a metallic taste in my mouth, and I didn't get dizzy spells. I wasn't afraid I might have a heart attack as I slept on a makeshift floor mattress in my apt and felt my heart race all night while my body from top to toe became increasingly numb and tingly. I wasn't without focus and direction and unable to concentrate. I'd never gotten shocks touching my bed mattress, home light switches, pots on my stove, and with every stroke of my cats. Before three months ago my daughter didn't have more than one unexplainable rash that hurt 'in' the skin as she described it, she didn't have headaches or feel nauseous and dizzy in our home, or experience the blood in her hand going cold. She never had sleepless nights. Before three months ago I hadn't abandoned my home at the advice of someone who could have sold me thousands of dollars worth of products and equipment by convincing me they would alleviate this situation. Instead I was told, "you have to get out of there, if you care about you and your daughters health you're going to have to move". I had never couch surfed with my 14yr old in tow while tying to maintain some semblance of a normal life or schedule for her. Before three months ago I hadn't researched everything I could find to educate myself about the real dangers of exposure to microwave radiation, or electromagnetic frequencies. I wasn't fully aware of cell towers and this invisible Wireless web that continues to be woven above all of our heads. I couldn't tell the difference between a Bell cell tower, a Rogers cell tower, a Globealive or Wind cell tower or a Telus cell tower. I'd never heard of Industry Canada or Spectrum, Canada Safety Code 6, or the Bioinitiative report. I hadn't spoken to Health Canada, Industry Canada, Canadian Environmental Legal Association, Environmental Health Clinic, Environmental Health Association, The Environmental Protection Office,

The Toronto Environmental Alliance, Public Health office, Canadian Association of Physicians for the Environment, my City Counselors office, trying to find some-any answers as to how safe it is to live in such close proximity to a cell tower. So far none of them have told me it's not safe, but thankfully I have better judgment, a body that is telling me the truth, and Liala, Kevin and Magda to confirm what I already knew. Before three months ago I hadn't spent 15 days getting 2 hours sleep a night because my body was still vibrating all the time, and the rest of the night in tears while feeling like I was losing my mind from sleep deprivation combined with the physical stress of feeling fight or flight 24 hours a day. I didn't have a clear and unpleasant physical reactions to my cell phone, the usage of cell phones by people in close proximity to me, the touch of my computer keyboard, or the experience of sitting close to the monitor for too long. I didn't feel my legs tingling-and going cold and slightly numb if I spent too much time in the same room as a Wi-Fi station. I didn't feel nauseous and have sharp pains go through my hand and up my arm if I held a cordless phone or a cell phone while in use. I didn't feel nauseous if I sat for too long or too close to a television. I do now. Before three months ago I couldn't tell you when I was standing within two to four blocks from a cell tower installation. I never thought twice about leaning on walls or in close proximity to the electrical wiring in a building, or lying on the floor above a basement for the same reasons. I never had to consider the effects of my neighbors Wi-Fi antennas and cordless phone base station broadcasting through any wall that stood between us. Before three months ago I hadn't heard the words Electro Sensitive or Electro Hypersensitive. I hadn't spent hours and hours on the phone trying to find a good doctor, preferably one who knew what a cell tower was and the possible effects of living 6 feet under or in front of one, only to find that it is nearly impossible to find any doctor at all taking new patients. Unfortunately for me, the ones that were, who offered the kinds of analysis or treatment I needed, cost an arm and or a leg or a plane ticket which I didn't have to spare at that time. Before three months ago I hadn't slept in six locations over a period of nine days in the middle of a three week period, while trying to find a place where I could get a good nights sleep because even after friends and family pulled the plug on the Wi-Fi, cordless phones, and everything but the fridge, my body was reacting to the wireless technology from the neighbors, emitting through the walls to where I slept. Before three months ago I hadn't heard of EMF Solutions, Earthcalm, Magda Havas, Jim Vella, the Weep Initiative, the Electro-sensitive Society, a Qlink, a gauss meter or an Electro smog meter. I hadn't read stories from hundreds of people around the world whose lives have been profoundly impacted by something we can't see or hear (for the most part) but can most definitely feel… by microwave radiation, and electromagnetic frequencies emitting at levels not meant for human consumption, by something we are led to believe is harmless and benefits us in more ways than it bombards us, in favor of convenience and especially someone's bottom line, over our continued health and longevity. Three months ago my life got turned upside down by exposure to microwave radiation while living 6 feet under and in front of 10 Cell towers. I am now preparing to move to a home yet to be found, and challenged by the fact that I have to consider my recently acquired sensitivities more than the location, size, and cost. There is no doubt in my mind or my body as to when and where this all began. There is no doubt in me at all, that human beings are affected on a biological level by exposure to microwave radiation well below the levels considered safe by Health Canada's Safety Code 6. A lot can happen in three months, and like anyone else, I don't like being blindsided. I share this with you not because I expect you to listen, but because I do want you to pay attention. Pay attention to the choices that are yours to make, and especially to the ones that are made for you. Because even if I had listened to every piece of advice in terms of precaution, I still would have had no choice about whether or not I

wanted to live in a neighborhood rife with cell towers... or should I say live and sleep 6 feet under and in front of 10 of them. Pay attention now, before you have to pay dearly.

Sincerely Veronica C.

http://www.magdahavas.com/wordpress/wp-content/uploads/2010/02/My_Life_6_Feet_Under_Cell_Towers.pdf

Paul's EMF Refugee Story

Paul Doyon, Building Biology Certified Electromagnetic Radiation Specialist (EMRS), speaking to you from a "normal" wired pay phone in Upper Lake, CA

A New Job at Kyushu University

In August of 2004, I received word that I would be hired as an Associate Professor at Kyushu University, one of Japan's top universities. I was 42 years old and my future was bright. I had at the time been living in Japan for approximately 15 years and had earned MA's in Teaching (TESOL) and Advanced Japanese Studies, not to mention my BA in Psychology before coming to Japan 15 years earlier. I was fluent in Japanese and had numerous publications under my belt. My future looked bright and if I had continued on that trajectory I would have certainly earned my Ph.D. or Ed.D. in Applied Linguistics and would be now a tenured professor at one of Japan's numerous universities. Things did not, however, work out that way.

Starting to Get Sick

In and around March of 2005 I started to develop a host of symptoms and I was extremely sick for six months before I was even aware — let alone even imagined — that the two cell towers within about 200 meters (and another about 500 meters away) from my apartment and perhaps the Wi-Fi from my neighbors' apartments bleeding into mine might have had something to do with the host of symptoms — insomnia, anxiety attacks, loss of appetite, rapid weight loss, excessive thirst, swollen lymph nodes, intestinal disturbances, increased sensitivities, weakened immune system, dry and irritated eyes, etc. — I was experiencing at the time. I had been eating a healthy diet consisting of mainly organic fruits and vegetables, brown rice, tofu, healthy meats, lots of Japanese tea, and was doing yoga every morning, and going to the gym three or four times a week. I was doing everything one is supposed to do to stay healthy and was quite perplexed as to why I was getting sick.

Six months earlier, in November of 2004, I had started my new job as an Associate Professor at Kyushu University in Fukuoka, Japan and had moved into their staff housing also in the city of Fukuoka with my wife and son (both who also experienced health complaints, though not as severe as mine).

I started to wake up earlier and earlier until I got to the point where I could not sleep anymore. I developed extreme thirst: I remember that I would go to the vending machine at the university during breaks and between classes to guzzle several bottles of water or oolong tea. I developed very bad skin allergies. My eyes became extremely red and irritated. My lymph nodes started to become swollen and painful. I was experiencing extreme fatigue. Most of the time I felt nauseated. I was getting heart pain and palpitations. I would wake up in the middle of the night dripping in sweat. I had intestinal disturbances. I needed to go to the bathroom several times a night. I started to develop brain fog and forgetfulness. I also started to experience anxiety attacks with things that never bothered me before like getting on the elevator, being left alone, driving through a tunnel, etc. Furthermore, I lost my appetite and I dropped about 20 kilograms (about 44 pounds) in a month.

Chronic Fatigue Syndrome

I started googling my symptoms and finally concluded that I had been experiencing what was being described in the literature as "Chronic Fatigue Syndrome" (CFS) and started reading everything I could on the subject. I read Martin Pall's work about free radicals, Garth Nicolson's work about mycoplasma infections, Andrew Cutler's work on heavy metal toxicity, and Michael Goldberg's work on Neurological Immune Endocrine Dysfunction and how autism, ADHD, CFS, and Alzheimer's were all connected. To be honest, there are probably at least 100 theories about this condition and I joined every Yahoo group addressing one or more of these. I eventually went to Kyushu University Hospital to talk with their CFS expert. (While the literal translation for CFS is 慢性疲労症候群 [manseihiroushoukougun] , they actually call it 自律神経失調症" [jiritushinkeishcchoushou] or "autonomic nervous system disorder.") He did some tests on me for a number of viral infections, toxoplasmosis, and (at my request) mycoplasama and told me basically that there was pretty nothing he could do for me and that my situation would worsen until I was pretty much just bedridden all the time.

He wanted to give me anti-depressants/anti-anxiety medication and I had him prescribe me antibiotics instead, as I had been by that point reading Dr. Garth Nicolson's theories on mycoplasma infections and believed that that might have been the major cause of my problems — though I later came to a different conclusion — as I was later to learn that the same symptoms described a disease identified by the Russians in the early 70s as "Microwave Sickness.".

Another interesting fact I discovered was that people in the USA started experiencing these same symptoms in 1984, the same year the first commercial cellphone network was set up across the country. CFS was initially dubbed by the media as Yuppie Flu. Well, if you think about it, yuppies were indeed the first people to start using computers and cellphones. In fact, the first Apple Macintosh made its debut the same year, along with commercial usage of the first MMR machines.

It's the Electropollution, Stupid

I eventually had to stop working I was so sick. I was frantically searching for the cause and a cure reading whatever I could find on the web. I was following the blog of a guy in Europe who was suffering from both CFS and Crohn's Disease and who had lots of interesting scientific theories about what was causing his problem when one day he wrote (to paraphrase him):

"It is the electropollution. I went to my parents' house in the French countryside and all my symptoms disappeared. I went back and measured the EMFs in my Amsterdam apartment and the EMFs were through the roof."

That really made me start thinking. I did feel better at night when people were not using their cell phones (in spite of the fact that I could not sleep without sleeping pills at the time). I also felt better out in the country away from all the cell towers in the city — though it was not 100%. I was also able to correlate my anxiety attacks with peak cell-phone usage times in Japan as I had a technician (really a PR man) from Nippon Telephone and Telegraph (NTT) come to my apartment and do measurements. The technician looked sicker than I was and was sweating like a pig. However, he did reveal to me the peak usage times which I was able to correlate with times I would experience extreme feelings of un-wellness.

Dr. Yayama

Before moving into this log house and while we were still living in the Kyushu University's staff housing, my wife was calling around Japan trying to find a doctor who did chelation therapy. She had called a doctor in Tokyo who said that we should just go and see a Dr. Yayama in the city of Yamato, Saga Prefecture, as he was the best alternative doctor around. When we finally went to see him, I read the following in his pamphlet: That modern diseases were caused by the following: 1. Heavy Metal Toxicity, 2. Electromagnetic Pollution & Geopathic Stress, 3. Pathogens (viruses, bacteria, fungi, and parasites), 4. Chemical Toxicity, and 5. the Body's Internal State (e.g. including psychological stress) and then noticed all the cell towers along the road on the drive back to Fukuoka.

A Log House in the Saga Mountains

When we started to realize that we were being bombarded by wireless exposures and that this might be behind our decline in health, we quickly started searching for and found a log house in a white zone — an area devoid of wireless signals — in the mountains of Saga Prefecture, (about 30 minutes outside of Fukuoka). We called the owners and asked if we could rent it out for just about three days. They told us that there was no cell phone signal there: Exactly what we wanted. After like the first 24 hours, I experienced a disappearance in I would say 50% of my symptoms. I then knew that this was it. I ended up staying in that log house for four months and I would say recovered during that time about 85-90% of my previous health.

Miraculously, also, Dr. Toshihiko Yayama's Clinic, was conveniently located about 20 to 30 minutes away from this log house.

And via multiple chelation treatment modalities (homeopathy, Chinese Medicine, and IV EDTA, etc.) of chelating the metals out of my body, having all the metal removed from my mouth, and by taking lots of antioxidants, Transfer Factor, and doing Qigong, I was able to recover much of my health and became much better able "tolerate" the EMFs.

Electrosensitivity

However, at the time, whenever I would get into range of a cell phone tower or around people with cell phones, many of these symptoms would start to come back. I could feel an intense pressure in my head, I felt nauseous, I would feel pain in the lymph nodes under my right arm and in my right testicle and groin area. Fortunately, gradually, over the years, these symptoms have diminished with many of them disappearing — though, at the time, it pretty much freaked me out.

The Zero Search Machine

Dr. Yayama, probably the most famous alternative medical doctor in Japan, is quite the amazing person. I would say he is a great genius. He invented a diagnostic tool he calls "Zero Search" which he connects

with a German Rayometer to check frequencies, as they have found that everything has its own signature frequency.

Hence, when I initially went to see him, he was able to pretty much tell me in less than 10 minutes that I had 1. systemic candida, 2. mycoplasma, 3. toxoplasmosis, 4. Epstein Barr Virus, 5. Cytomegalovirus, 6. mercury toxicity, 7. aluminum toxicity, and 8. lead toxicity. Unbeknownst to him at the time, the mycoplasma, Epstein Barr, and Cytomegalovirus had been confirmed by blood tests earlier at Kyushu University Hospital.

My wife (who is Japanese), at the time, wrote to all the Japanese media outlets to get some coverage for our newly discovered problem that those seemingly innocuous waves of wireless radiation were damaging to our health. She received zero replies; they seeming — for (what are now for me) obvious reasons — did not want to touch our story.

EMF Refugee & "Denjiha Nanmin" (電磁波難民)

After four months of living in this log house, we started running out of our savings. I was probably feeling from between 85-90% better but would still start to feel sick when exposed to EMFs. We moved back into our apartment and bought a canopy to sleep under and shielded the windows with special material to block out the EMFs. In early 2006, I started a Japanese Yahoo group in Japanese called "Denjiha Nanmin" (電磁波難民） and its equivalent Yahoo group in English called "EMF Refugee." (We now have almost 1000 members.) I started having people contact me from all over Japan who were having the same problems. We had a meeting at my apartment in Fukuoka. People flew from all over Japan.

Ad Hoc Publications

Around about the same time, I also wrote several papers that were published ad hoc on the Internet: One was called, "Do You Have Microwave Sickness?" (originally published in Feb. 2006) where I wrote, for example

"19. Exposure to microwave radiation has also been shown to effect an abnormal increase in nitric oxide (NO). One theory holds that an abnormal increase in cellular calcium will also lead to an abnormal increase in cellular NO, which in excess produces a damage-producing free radical or oxidant called peroxynitrite."

and the other one "Are Microwaves a Major Causal Factor in Chronic Fatigue Syndrome (CFS) and Myalgic Encephalomyelitis (ME)? (originally published in July 2006). These got quite a bit of fanfare given the fact that I was an associate professor at one of Japan's top universities. Next-up (France) took up the story and there was an article published in the Belgium newspaper LeLibre entitled "Les micro-ondes liées à la fatigue chronique?" or "Are Microwaves Related to Chronic Fatigue?" The Townsend Letter Group even published an article about me in their newsletter in 2009 entitled "Microwaves Role Examined."

Looking for a Place to Live: Kunming, China

At any rate, after going back and forth with a Japanese president of an IT firm who himself developed ES about starting an eco-village for ES people, I eventually decided that the levels of EMF were just too high for me in Japan. I decided to search for another place to live and took a trip around Southeast Asia — Thailand, Myanmar, India, Southwest China, and Laos — looking for a suitable place to live. Upon

traveling to Thailand, I realized that I felt better there EMF-wise than in Japan, and then felt better China than I did in Thailand. I attributed it to the fact that at the time, Japan (if my memory serves me right) was moving into 3G, Thailand was still working on 2G, and China had stricter regulations regarding ambient levels of EMF. I eventually severed my ties with Kyushu University and ended up in the city of Kunming, Yunnan Province in 2006.

It was a fascinating place to live and I started studying Mandarin, worked at a language school and eventually secured a teaching position at Yunnan Normal University, where I worked for a year.

After living there alone for six months, my wife and son joined me.

We had a very interesting time living in Kunming together for a year. Our weekends and breaks were often spent taking trips to other parts of Yunnan Province. Interestingly, a person named Peter Monaghan had contacted me in response to an ad I put on GoKunming (the local community website) selling some stuff who said that his mother was a Doyon and that he was coming to Kunming to teach English at one of its universities. It ended up that his mother was my father's cousin, had grown up in the same town as my father in Quebec (St. Benoit), and that Peter was my second cousin. Small world, eh! We often spent our weekends together either taking trips around the city or to other cities in the vicinity.

Auroville

However, after a year of living in Kunming together, we decided to leave and go live in the intentional community of Auroville, India, which was very progressive with alternative forms of medicine, agriculture, building, education, health, and electromagnetic policy (i.e. there was a rule in place that no cell towers could be built within the city's limits of 20 square kilometers). They do not use pesticides or chemicals on their land, food is organic vegetarian, medicine is mainly Ayurvedic, Chinese, Naturopathic, and Homeopathic, and buildings are Building Biology standard: i.e. a very healthy place to live.

But before doing that we had a nice trip together through Thailand, which I love except for all the chemicals there to which my body reacts. Ah!

Back to Thailand: ITM

Auroville was wonderful, but at the time, we did not have the funds to sustain ourselves in this sustainable community. I needed to go to China to do training with the British Council to become qualified as an IELTS examiner and got stuck in Chiang Mai, Thailand because China would not give me a visa. I ended up doing a Thai Massage Workshop at a school called ITM in Chiang Mai.

Mae Fah Luang University: Chiang Rai

Later I got a job teaching English as a Foreign Language (EFL) at Mae Fah Luang in Chiang Rai, Thailand, about two hours northeast of Chiang Mai.

Allergies Gone Crazy

After living in Thailand for awhile, I started to gradually experience a worsening condition of skin allergies: I think it was a combination of dust, pollen, mold, smoke (from the burning of the fields), pesticides, formaldehyde, and food chemicals. My skin was extremely itchy, red, and irritated. I needed to take sleeping pills to sleep and when I woke up my sheets would be covered with blood from the unconscious scratching that had occurred while I was sleeping.

Escape to Chiang Mai
I had to eventually leave my teaching position and seek help in Chiang Mai. After a month of seeking treatment from all the alternative health practitioners (acupuncturists, chiropractors, naturopaths, and so on) and not getting better, we decided to return to Japan.

Back to Japan: Dr. Sei Takahashi: An Amazing Acupuncturist
However, after a month of daily acupuncture treatments with an amazing acupuncturist,and medical qigong practitioner, Dr. Takahashi Sei, at his clinic Ishindo, not to mention daily far infrared saunas, and the drinking of lots of alkaline water, I was thankfully pretty much back to normal.

Utsunomiya University
Within a month, I had applied for teaching positions at a number of Japanese universities and had several interviews lined up. I applied at Utsunomiya University and received a phone call from the directly after getting home. She wanted to hire me. I accepted and moved to the city of Utsunomiya in March of 2010.

I worked there until March of 2011 when Fukushima happened and we were approximately 100 miles away — too close for comfort.

Fukushima

Escape to Europe

Back to Japan

Chile

A Return to the USA after 25 Years Abroad

The International Institute for Building Biology and Ecology: Electromagnetic Radiation Specialist (EMRS)

Out of Sight and Out of Mind
When something is out of sight, it is also out of mind — and microwaves from cellphones, cellphone towers, and other wireless-radiation emitting devices are invisible, tasteless, odorless, and cannot be sensed with touch. Naturally, it has been difficult for many — even most doctors — to fathom them as being a culprit in the disease process. However, increasingly, people worldwide are starting to wake up to the fact of what is indeed the cause of their previously mysterious symptoms. An increasing number of these people become noticeably ill when exposed to this invisible source of pollution and they are starting to connect the dots. Also, it is becoming known that people with an inordinate amount of metal toxicity seem to be particularly sensitive. When people realize the problem, and come together to find solutions, progress can be made.

Connecting the Dots
After having had this experience, and in line with the growing quantities of ambient electromagnetic pollution in our environments, I began to suspect that the large number of people around me becoming sick with some kind of illness may also have been unwittingly affected by this health-damaging ambient electromagnetic radiation. Just as cellphones were starting to become popular, I remember a student of mine's three-year-old daughter dying of influenza. This was the first time I had ever heard of a little girl

dying of influenza, though apparently it is increasing more common and one has to seriously consider the fact that all this electromagnetic radiation we are being exposed to 24/7 might in fact be weakening our immune systems. It seems that when people catch colds nowadays that it takes them longer to recover — whereas instead of the normal 3-4 days we are now seeing people sick for up to two weeks or longer. We are being fed with the idea that the bugs are becoming stronger and not rather that our immune systems might be becoming weaker.

Since that time, I had the unfortunate fate to have known a number of people who have committed suicide, developed or died of cancer, had their children diagnosed with Autism Spectrum Disorders (ADS) or ADHD, developed brain tumors, been diagnosed with intestinal disorders (Crohn's Disease, Irritable Bowel Syndrome, Colitis), developed vision problems, strokes, and were diagnosed with epilepsy. I have also known women who have had miscarriages due to deformity of the fetus. This has become the norm — but it is not normal. Also, every year, in Japan, the news programs report about an increasing number of people suffering (or dying) from heat stroke in the summer. Something I had never heard when I first went there in 1988. When one looks at the research on how EMFs negatively affect the immune system, the endocrine system, the autonomic nervous system, alter the brain's neurotransmitters, open up the blood-brain-barrier, damage DNA, and create a deluge of free radicals in the body, one can view the causal factors of many of these disease states in a new light.

Public Brainwashed by the Wireless Industry

While the Wireless Industry has had the money to lobby politicians to get the laws they wanted passed, to fund the researchers to get the research results they wanted, and to promote their desired narrative through their media arms, in the past five-or-six-or-seven-or-so years, I have started to notice not only a shift in how the media is starting to change the way it covers this problem, but also in the public's acceptance and acknowledgement that this may in fact be a serious problem, whereas before the media was pumping out — and the public regurgitating — a narrative in which anyone questioning the health and environmental effects of wireless radiation was nothing but a tinfoil-hat-wearing conspiracy-theorist Luddite. There is now an increasing acknowledgement that this wireless might indeed be an actual serious health and environmental quagmire; that it might in fact even be behind unexplained increases in a plethora of health and environmental problems — autism, ADHD, chronic fatigue syndrome, MS, diabetes, Parkinson's, Alzheimer's, epilepsy, not to mention the skyrocketing rates of cancer, plus the disappearance of insects, frogs, other amphibians, and birds —and that we might have to seriously do something about it.

The Simple Truth

Dr. Robert O. Becker's statement 30 years ago in his book The Body Electric, may very well be accepted as the truth by the majority of people alive in my lifetime:

The dangers of electropollution are real and well documented. It changes, often pathologically, every biological system. What we don't know is exactly how serious these changes are, for how many people. The longer we as a society, put off a search for that knowledge, the greater the damage is likely to be and the harder it will be to correct. p. 304

http://electromagneticsafeplanet.com/pauls-story

Additional Resources

Further testimonials from individuals affected in some way by the proliferation of wireless technologies can be found here: https://wearetheevidence.org/harmed-by-wireless/

Of the tens of thousands of peer-reviewed studies that exist confirming the negative biological impacts of radiofrequency radiation, only a very small portion have been included in this publication. Because the science is always changing and new research is always underway, a few links to research databases and pages that contains links to numerous other studies have been included here:

- https://www.emf-portal.org/en/updates/articles?maxAge=60
- https://www.ncbi.nlm.nih.gov/pubmed?linkname=pubmed_pubmed&from_uid=16041996
- https://www.ncbi.nlm.nih.gov/pubmed?cmd=link&linkname=pubmed_pubmed&uid=25475345&log$=relatedarticles&logdbfrom=pmc
- http://www.justproveit.net/studies
- http://stopsmartmeters.org/the-science/
- http://annlouise.com/books/zapped/zapped-resources/
- http://www.truehealthfacts.com/reasearch-news/CellPhonesEMR.html
- https://wirelesseducationaction.wordpress.com/the-reality-wi-fi-in-schools/
- http://smartmeterdangers.org/smart-meter-research/
- http://emfsafetynetwork.org/shortcut-to-science/
- http://www.powerwatch.org.uk/science/studies.asp
- http://wifiinschools.org.uk/30.html
- http://www.safeinschool.org/2011/01/international-warnings-on-wi-fi.html
- http://safetechforschoolsmaryland.blogspot.com/2016/02/teacher-unions-and-parent-teacher.html
- http://stopsmartmeters.org.uk/resources/resources-scientific-studies-into-the-health-effects-of-emr/
- http://c4st.org/electrosensitivity/

Lastly, Major insurance firm, Swiss Re, warns of large losses from "unforeseen consequences" of electromagnetic frequencies:

http://media.swissre.com/documents/SONAR_+Emerging_risk_insights_from_Swiss_Re.pdf

The insurance companies are starting to grasp what the stakes are here; do you?

Conclusion

We don't want to believe that our new toys to which we are so attached and which bring enormous profits could also cause our demise or that of our children. But science is not about belief. Government's responsibility to their citizens should not be either.

— Devra Davis, PhD

If governments did their job correctly and were the responsible entities they were meant to be, electrosmog might never have become a problem. Cell phones would never have made it past the drawing boards, and we'd all be talking during power outages because cordless phones would never have made it off the shelf either. Rather than experiencing the slow connectivity wireless networking offers, every computer in the world could be connected with Ethernet and Fiber Optic cables.

This dream of a safe, hospitable world is still possible. But nobody else is going to make it happen for you. It will require each of us to stand up for our human rights. It took 50 years for the curtain to fall on tobacco; who knows how many decades of lies and millions of causalities will be required before the truth becomes apparent to the mainstream?

Despite the large body of emerging science confirming the negative health implications of pulsed radiofrequency radiation and the existence of electromagnetic hypersensitivity, the majority of the world's population remains in the dark, ignorant or unreceptive of the truth. In a world dominated by science and research, it is quite unfortunate that even well-regarded scientists remain opposed to the truth. Many governments themselves are compromised, lobbied by the very industries they are there to presumably 'regulate'.

Until there is a critical shift in the way technology is used in this world, both wired and wireless, it will be up to the individual to become empowered to make a difference. What little progress has been made so far towards a healthier, safer, more sustainable future, has been made by like-minded activists working towards a healthier future for ourselves and our offspring. In the face of critics, skeptics, tin-foil hat paranoids, and the ever-growing influence of industry, facts will ultimately prevail. If it is when, not if, a critical reorganization of our technological infrastructure occurs that we can pursue its own betterment instead of resenting the ailments that have befallen us.

Regardless of industry pseudoscientific claims, the jury is no longer out. There are tens of thousands of peer-reviewed studies out there confirming the negative health implications of radiofrequency radiation; some of them are contained in this publication. It is not a valid decision to choose to "believe" the science or not. The truth does not go away simply because it is ignored.

If you are still unreceptive of the truth, however forbidding it may be, take some time to look at some more research. Anyone who isn't yet concerned about the perils of wireless technologies hasn't looked at the research carefully enough yet.

If you are receptive and acknowledge the truth, pass it on. Ditch your cell phone and cordless phones and replace them with corded phones. Apart from the physiological impacts of wireless technology, the social and physiological implications of wireless technology are more

visible. An increasing social disconnect among one another is being experienced, namely due to the rise in usage of mobile devices. Those who remain unconvinced of the health implications of mobile devices may appreciate the humanity of the era predating cellular technologies.

Wireless technologies are often likened to tobacco. Their impacts on biological life, after all, are varying but very similar. Despite the ubiquity of tobacco in society even five decades ago, the usage of cigarettes has declined dramatically and constantly since the collapse of industry claims of tobacco's safety in the late twentieth century.

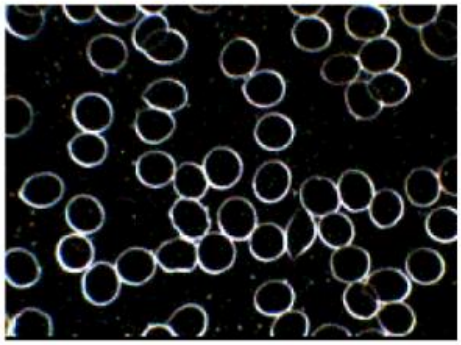
A growing number of scientists agree that wireless proliferation is, and will continue to be, the biggest public health crisis of the twenty-first century, perhaps the biggest health crisis humanity as ever faced. However long it may take for our world to return to a safer state, there is no need to wait for government approval of industry acknowledgement. The technology that will keep us safe is already here; in the form of corded landlines, hardwired Ethernet cables, and fiber-optics. Truly, a return to the dominant technologies of yesteryear is what will pave the way forward in the future.

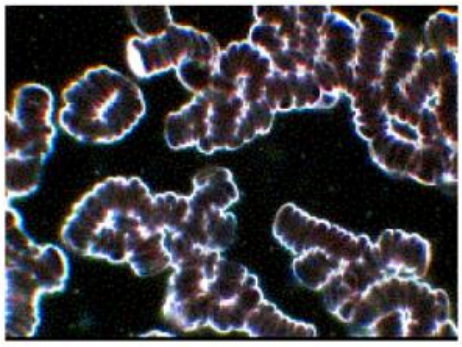
Appendix A: Measuring Radiation

Detecting and measuring radiation is beyond the scope of this text. To measure levels of RF radiation in your home:

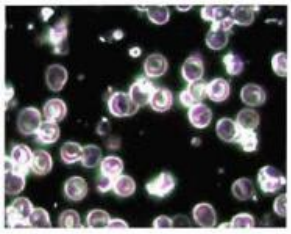
- Purchase an Electrosmog meter. You can buy meters of varying sensitivities at http://stopsmartmeters.org/store
- Aluminum foil shielding is a last resort and can possibly make levels worse. However, because radiofrequency fields do not penetrate metal well, if done right and levels are confirmed with a meter, shielding can significantly reduce your exposure to radiofrequency fields.
- Want to find out if there are any cell towers or antennas radiating near you? Look no farther than Antenna Search and TowerKill!
- You can use Xfinity's Wi-Fi search portal to find out if there are any radiating Wi-Fi hotspots near you.

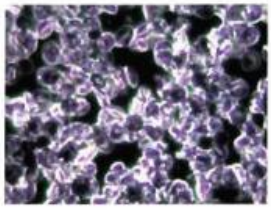
Appendix B: Pictures & Diagrams





Red Blood Cells Before and After a 90-Second Cell Phone Call

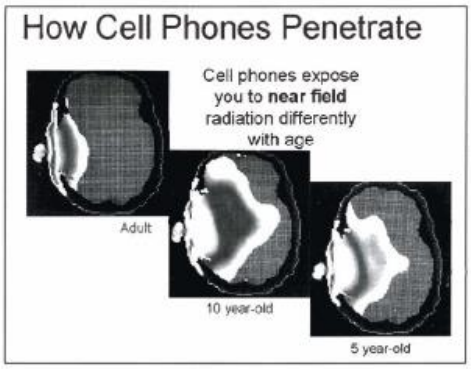


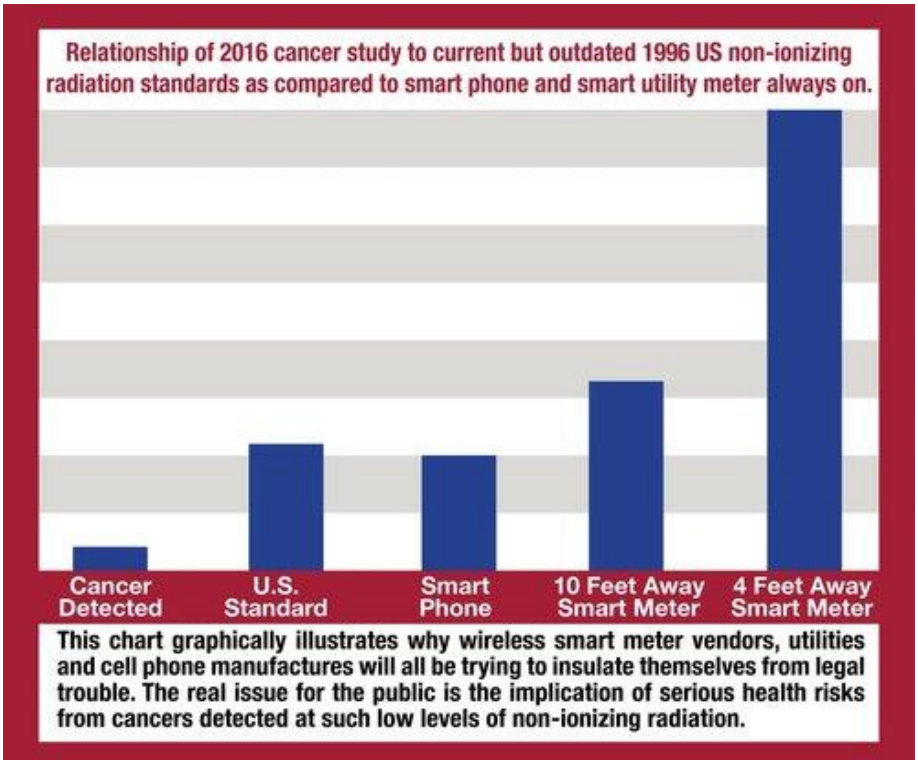


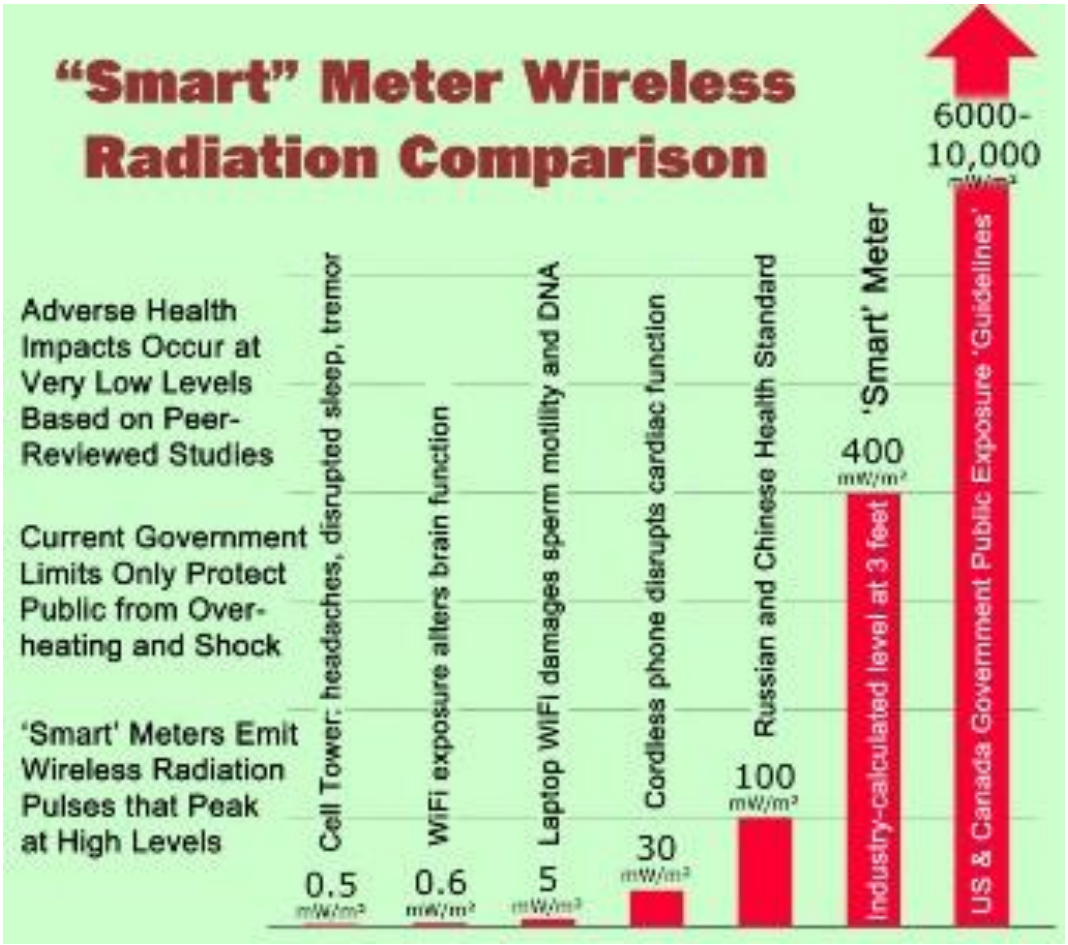
Disrupted red blood cell intercellular communication occurs within minutes of exposure to information carrying radio waves. Red blood cells must be able to sense the location of other blood cells to avoid clumping. Slide at left: prior to cell phone exposure – red cells are functional. Slide at right: after five minutes on a cell phone red cells are clumped and non-functional.

Deformed cows near cell phone towers in Germany are just one example among many animal deformities appearing around the world. Research has also connected the worldwide disappearance of frogs, birds, and insects [most recently bees] with the dramatic increase of electrosmog permeating our planet.

The amount of radiation penetration of a skull for an adult, a 10-year-old child, and a five-year-old child.




Relationship of 2016 cancer study to current but outdated 1996 US non-ionizing radiation standards as compared to smart phone and smart utility meter always on.
Cancer Detected
U.S. Standard
Smart Phone
10 Feet Away Smart Meter
4 Feet Away Smart Meter
This chart graphically illustrates why wireless smart meter vendors, utilities and cell phone manufactures will all be trying to insulate themselves from legal trouble. The real issue for the public is the implication of serious health risks from cancers detected at such low levels of non-ionizing radiation.


"Smart" Meter Wireless Radiation Comparison
Adverse Health Impacts Occur at Very Low Levels Based on Peer-Reviewed Studies
Current Government Limits Only Protect Public from Over-heating and Shock
'Smart' Meters Emit Wireless Radiation Pulses that Peak at High Levels
Cell Tower: headaches, disrupted sleep, tremor
0.5 mW/m²
WiFi exposure alters brain function
0.6 mW/m²
Laptop WiFi damages sperm motility and DNA
5 mW/m²
Cordless phone disrupts cardiac function
30 mW/m²
Russian and Chinese Health Standard
100 mW/m²
'Smart' Meter
400 mW/m²
Industry-calculated level at 3 feet
6000-10,000 mW/m²
US & Canada Government Public Exposure 'Guidelines'

Appendix C: Listservs & Support Groups

The number of refugee camps for electrohypersensitive individuals in the United States and around the world is growing exponentially. You can join the discussion today if you are interested in either planning or joining an EMF free retreat.

You can follow Stop Smart Meters! and Save Landlines on Twitter and subscribe to Stop Smart Meters! Newsletters. You can also find local groups in your area to join in the fight against smart-meters and forced wireless proliferation.

Want to get involved more? Join an organizing Listserv:
Stop Smart Meters (Electric Embers)
Save Landlines (Electric Embers)
EMF Sanctuary (Electric Embers)
Occupy EMF Harm/Housing (Yahoo Groups)
Occupy EMF/MSC Harm (Yahoo Groups)
EMF Refugee (Yahoo Groups)
Living Simply Off Grid (Yahoo Groups)
Small House Society Online (Yahoo Groups)
No-Spray! (Yahoo Groups)

Teleconference Calls

→ Occupy EMF's conference calls held weekly Thursdays at 11:00am Pacific (click here for agenda).

Appendix D: Further Resources

One text can only cover so much material. The following websites, books, and documentaries provide more in-depth analysis of this issue. Excerpts either partially or in full from some of these resources may have been referenced in this text:

WEBSITES

StopSmartMeters.org
SaveLandlines.org
On the Level: Car Free Blog
Environmental Health Trust
Windheim EMF Solutions
International Institute for Building-Biology & Ecology
We Are The Evidence
National Association For Children and Safe Technology
Truth & Facts Never Lie
What Is 5G?
EMF Research
The EI Wellspring
EMFs.com
Understanding EMFs
International Electromagnetic Fields Alliance
Smart Meter Dangers
Smart Grid Awareness
Smart Meter Education Network
Center for Electrosmog Prevention
Citizens for Safe Technology
Electric Sense
Wi-Fi in Schools
Cell Tower Dangers
Electronic Silent Spring
Canadians 4 Safe Technology
Clear Light Ventures
Create Healthy Homes
Cell Phone Danger
EMF Wise
RF/EMF
RF Safe
Radiation Education
EMR Safety
EMF Safety Network
EMF Help Safety
The EMF Experts
Healthy Housing Research Institute
Electrosensitivity
Cell Phone Radiation USA
Show The Fine Print
The BabySafe Project
Electrical Pollution
Freedom Taker

Parents for Safe Technology
Microwave News
Cellular Phone Task Force
Global Union Against Radiation Deployment From Space (GUARDS)
No Cell Towers on Schools
Moving to Learn
Safe Schools IT Alliance
Wireless Education Action
Radiation Refuge
Wired Child
WEEP
Electromagnetic Health
Wi Cancer
Radiation Research Trust
EMF Scientist
Kevin Mottus
Smart & Safe
Dr. Magda Havas, PhD
First Do No Harm blog
Coalition to Stop Smart Meters in BC
Maine Coalition to Stop Smart Meters
Stop Smart Meters Australia
Total EMF Solutions
Wi-Fi in Schools – Australia
Olga Sheean – "Beyond Belief: exposing the deeper truth"
Safer Grid
Electromagnetic Radiation Safety
SPGO EMF Assessment, Consulting and Remediation
Elektrosmog (Electrosmog) – *click Translate → English*
Gary C. Vesperman
Gary Vesperman documents
Wireless Watch Blog
Oscillatorium

BOOKS & FURTHER READING

BioInitiative Report - http://bioinitiative.info/bioInitiativeReport2012.pdf - *1,557 pages*
Overpowered – Martin Blank
Chemical and Electrical Hypersensitivity: A Sufferer's Memoir – Jerry Evans
Disconnect: The Truth About Cell Phone Radiation, What the Industry Has Done to Hide It, and How to Protect Your Family – Devra Davis
The Big Disconnect: Protecting Childhood and Family Relationships in the Digital Age – Catherine Steiner-Adair, EdD.
Reset Your Child's Brain: A Four-Week Plan to End Melt-downs, Raise Grades, and Boost Social Skills by Reversing the Effects of Electronic Screen Time – Victoria Dunckley
An Electronic Silent Spring – Katie Singer
Cell Phones: Invisible Hazards in the Wireless Age: An Insider's Alarming Discoveries about Cancer and Genetic Damage – Dr. George Carlo
Cell Phones and The Dark Deception: Find Out What You're Not Being Told… And Why – Carleigh Cooper
Glow Kids: How Screen Addiction Is Hijacking Our Kids-and How to Break the Trance – Nicholas Kardaras
Zapped: Why Your Cell Phone Shouldn't Be Your Alarm Clock and 1,268 Ways to Outsmart the Hazards of Electronic Pollution – Ann Louise Gittleman
"The Cell Phone Poisoning of America" – Lynn Quiring, RPh, CCN, NMD
"Captured Agency" – Norm Alster, Harvard Ethics
The Body Electric – Dr. Becker
The Effect of Microwaves on the Central Nervous System – W. Bergman – Ford Motor Company, 1965
Microwaving Our Planet: The Environmental Impact of the Wireless Revolution – Arthur Firstenberg, 1997

Olga Sheean's Collection of Public Documents

NO SAFE PLACE – 15 June 2016
https://olgasheean.com/wp-content/uploads/2016/07/NO-SAFE-PLACE-Letter-to-Gregor-Robertson-240716.pdf

HEADS IN THE SAND, PIES IN THE SKY – 7 November 2016
https://olgasheean.com/wp-content/uploads/2016/11/Heads-in-the-sand-pies-in-the-sky-1.pdf

WHO – Setting the standard for a wireless world of harm – 30 January 2017
https://olgasheean.com/wp-content/uploads/2017/02/WHO-setting-the-standard-for-a-wireless-world-of-harm.pdf

DOCUMENTARIES

Take Back Your Power – This documentary highlights the negative impacts of smart-meters to our health and the environment. *While* Take Back Your Power *documents smart-meter problems well, many of the solutions proposed are dubious ones, and Josh del Sol believes climate change is not caused by humans, a viewpoint we believe is dangerous and ignorant.*
Public Exposure: DNA, Democracy and the Wireless Revolution – When do we draw the line?
Offline is the New Luxury – Where are the "white spots" on the map? Are there any sanctuaries left in a world full of wireless?

Resonance: Beings of Frequency – This sensational documentary reveals the harm of existing in a world of man-made wireless frequencies.
Full Signal – With over 3.5 billion cell phone users and thousands of cell towers popping up across the globe, people are starting to feel the effects.
"Wi-fried" on ABC 2016 – 2016, 30 mins.
Generation Zapped – We are getting ZAPPED by wireless technology.
Mobilize: A Film on Cell Phone Radiation – The long term effects from cell phone radiation are investigated.
Is Your Cell Phone Killing You? – 2011, 45 mins.
Beyond Coincidence – The Perils of Electrical Pollution, Part 1 – 2011, 11 mins.
Beyond Coincidence – The Perils of Electrical Pollution, Part 2 – 2011, 8 mins.
Grounded: Could It Happen to You? – 2013, 74 mins.
Microwaves, Science, and Lies – 2014, 92 mins.
Lo and Behold: Reveries of the Connected World – 2016, 98 mins.
Invisible Danger – 2016, 172 mins.

https://wirelessaction.wordpress.com