

Electromagnetic Pollution and Effects on Health and Solutions

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EMF HEALTH EFFECTS STUDIES AND SOLUTIONS

Do you have patients with unresolved health issues despite your treatments? Electromagnetic pollution is often a major part of the problem, yet often overlooked. As a practitioner in health care how much do we know about **electromagnetic field (EMF)** or **electromagnetic radiation (EMR)**?

According to studies done among general practitioners in Germany, "The association between general practitioners' concern about EMF and their knowledge was analysed using multiple linear regression. In total 435 general practitioners participated in the study. Four groups were identified by the latent class analysis: 43.1% of the general practitioners gave mainly correct answers; 23.7% of the general practitioners answered low frequency EMF questions correctly; 19.2% answered only questions relating EMF with health risks, and 14.0% answered mostly "don't know". There was no association between general practitioners' latent knowledge classes or between the number of correct answers given by the general practitioners and their EMF concern, whereas the number of incorrect answers was associated with EMF concern. Greater EMF concern in subjects with more incorrect answers suggests paying particular attention to misconceptions regarding EMF in risk communication" (Berg-Beckhoff, et al., 2014).

Problem is that even as a healthcare practitioners, we do not have much knowledge or education regarding EMF and EMR when we should have them because it affects every living cell.

Electromagnetic fields include:

Radiofrequency/Microwave Radiation (RF): cell phones, cell phone towers and antennas, wifi, bluetooth, microwave ovens, cordless phones, air pods or baby monitors, smart meters, smart clothing including diapers, thermostats such as Nest and virtual assistants such as Alexa ("Equipment Authorization," 2018).

Magnetic Fields (MF): power lines, electronic chargers, circuit breaker panel, transformers, motors, wiring errors, water pipe currents.

Electric Fields: home wiring, power strips, ungrounded electronics, lamps/lighting, cords and chargers ("Electromagnetic Fields and Cancer", n.d.).

Dirty Electricity (DF): Fluorescent light bulbs, dimmer switches, solar panel inverters, electronic chargers, smart TV's, modern electronics ("Dirty Electricity," n.d.).

Geopathic Stress (GS): Disruption in Earth's magnetic field due to water veins, fault lines, tectonic movement, and Hartmann and Curry lines ("Geopathic Stress," n.d.).

Artificial Light (AL): Given off by modern electronics and light bulbs.

Some common misconceptions:

- Electromagnetic Fields are not harmful because we cannot see or feel them.
- Safety standards are regulated and up to date. The devices are obviously safe because of their widespread availability and use.
- There is no science that correlates emf exposure to health effects.
- Non-ionizing radiation emitted from cell phones, wifi and bluetooth is not harmful.
- Lower frequencies from home electronics are safe.

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These are some of the facts:

- Often studies that show no effects have been sponsored/funded by the Telecom companies. Studies confirming adverse health effects are often downplayed by the media which is likely funded by telecommunication agencies (Huss, et al., 2007).
- Safety standards in the US have not been updated since 1998.
- **Specific Anthropomorphic Mannequin (SAM)** head is larger than 97% of population
- It is filled with water, sugar, salt and the exposure time was only 6 minutes (“Outdated FCC "Safety" Standards,” (n.d.).
- Not only ionizing radiation is harmful but non-ionizing radiation can be damaging indirectly through the **Voltage-Gated Calcium Channels (VGCCs)**.
- When exposed to EMFs, the VGCC's allow an excessive amount of calcium to enter the cell leading to a rise in the production of free radicals (Pall, 2018).
- Potential consequences: single and double strand breaks in DNA, cancer, breakdown of blood brain barrier, male and female infertility, depression, psychiatric symptoms, oxidative stress, melatonin depletion, insomnia, cataracts, tachycardia, arrhythmia and even (sudden cardiac death), hormonal disruption, mitochondrial damage (Barnett, 1994).
- 5G: higher the signals more exposure to radiation and damage to living things

Women's Health

There is sufficient evidence to conclude that long-term relatively high **extremely low frequency (ELF) magnetic field (MF)** exposure can result in a decrease in melatonin production, which may increase risk for breast cancer. It has not been determined to what extent personal characteristics, e.g., medications, interact with extremely low frequency magnetic field exposure in decreasing melatonin production. New research indicates that MF exposure, in vitro, can significantly decrease melatonin activity through effects on metaan important melatonin receptor. Five longitudinal studies have now been conducted of low melatonin production as a risk factor for breast cancer. There is increasingly strong longitudinal evidence that low melatonin production is a risk factor for at least post-menopausal breast cancer (Davanipour and Sobel, 2012). This is eye opening for me to relate decreased melatonin production and breast cancer because when I think of melatonin decrease, I would only think of insomnia as a result.

Men's Health

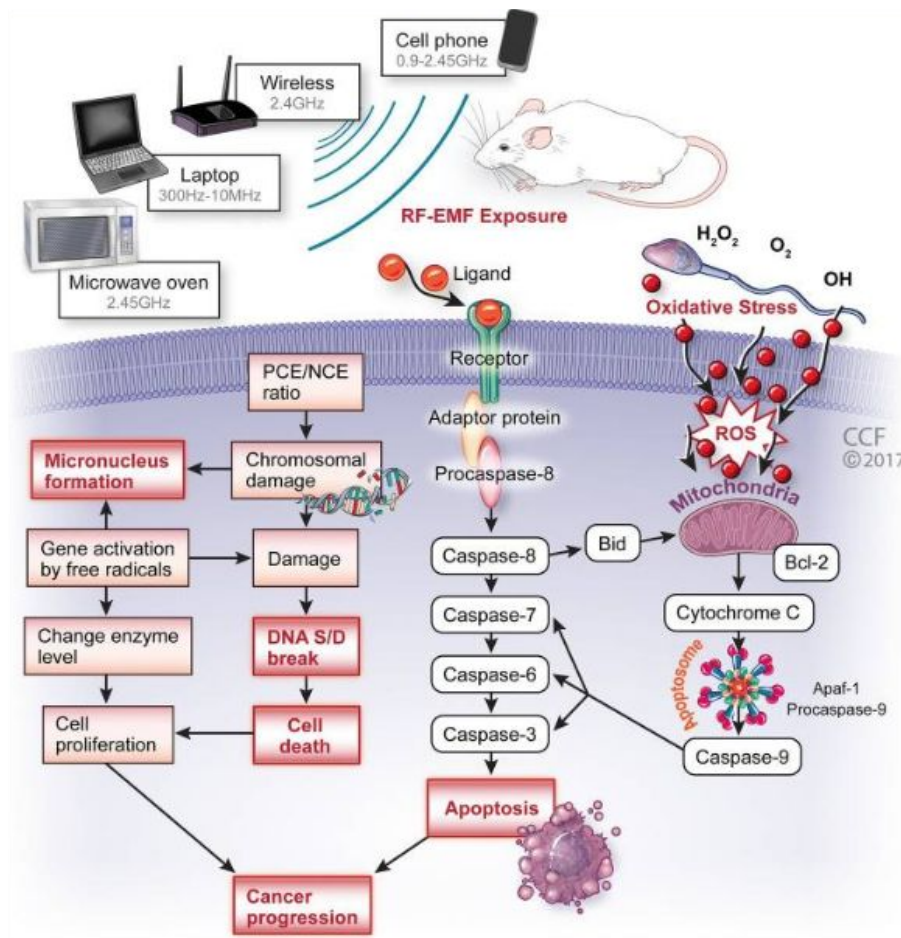
Studies have shown that sperm samples of a healthy males were divided into two groups and group that were exposed to a cellphone on talk mode for 5 hrs and other group did not. Results showed The number of spermatozoa with progressive movement in the group, influenced by electromagnetic radiation, is statistically lower than the number of spermatozoa with progressive movement in the group under no effect of the mobile phone. The DNA fragmentation was also significantly higher in this group (Gorpinchenko, et al., 2014).

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One other study states “The study concludes that the RF-EMF may induce oxidative stress with an increased level of reactive oxygen species, which may lead to infertility. This has been concluded based on the available evidence from in vitro and in vivo studies suggesting that RF-EMF exposure negatively affects sperm quality” (Kesari, et al.,2018).

Gene and Protein

It is proven that EMF breaks DNAs which is the cause of cancer. Cells react to EMF and radio frequency by producing harmful stress proteins.



Kesari KK, Agarwal A, Henkel R. Radiations and male fertility Fig. 2

This mechanism by suggesting radiation-induced oxidative damage may increase DNA damage, micronuclei formation and leading cancer progression. This has been linked to distorted sperm head and mitochondrial sheath in sperm tail which leads to apoptosis and finally cancer progression. Sperm DNA damages are present with cell phone usage due to overproduction of reactive oxygen species. Not only cell phones but exposure to microwave, laptop and wifi all increase oxidative stress and cause DNA damage (Kesari, et al., 2018).

Fetal Neonatal and Children

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 associated with mobile phone use for voice calls but the association was limited to children exposed to relatively high lead. This study suggests that simultaneous exposure to lead and RF from mobile phone use was associated with increased risks of ADHD symptoms (Byun et al., 2013).

As children's brains are more susceptible and delicate, the Specific Absorption Rate for a 10-year old is up to 153% higher than the specific absorption rate (SAR) for the Specific Anthropomorphic Mannequin (SAM) (dummy) model. "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 ten times greater than adults." Therefore, a new certification process is needed that incorporates different modes of use, head sizes, and tissue properties (Gandhi et al., 2012).

In addition, the evidence that power lines and other sources of ELF are consistently associated with higher rates of childhood leukemia has resulted in the International Agency for Cancer Research (an arm of the World Health Organization) to classify ELF as a Possible Human Carcinogen (in the Group 2B carcinogen list). Leukemia is the most common type of cancer in children. Increased risk for childhood leukemia starts at levels almost one thousand times below the safety standard. Leukemia risks for young boys are reported in one study to double at only 1.4 mG and above (Green et al., 1999).

Another thing we need to be aware is a combination of effects with chemicals, molds and heavy metals. These are called **Synergistic effects**: two or more agents combined is significantly greater than the sum of the effects of each agent administered alone, subject to the maximum possible effects in biological systems (Kostoff, 2018).

The **chemicals** such as glyphosate stimulate VGCC and N-methyl-D-aspartate (NMDA) receptor activity. When NMDARs are overstimulated, excitotoxicity and subsequent neurodegeneration occurs (Blanke et al., 2009).

The **lead** and **mercury** neurotoxicity is lead by NMDA receptors. Wifi can increase mercury release from amalgam restorations (Paknahad et al., 2016). One other study of Autism and relation to heavy metal toxicity and EMR showed "The efficiency of heavy metal detoxification increased dramatically when EMR was eliminated" (Mariea and Carlo, 2007).

The study done at Al-Nahrain University has shown, *Aspergillus flavus* **mold** produced more or less Aflatoxin depending on which magnetic field angle it was exposed (Ahmad et al., 2013). This shows relation of EMF and mold production.

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How much exposure am I getting at my home?

I got mine measured by the professionals, EMF Knights. Below is my measurements at my one bedroom apartment.

Name: Yoo Lee Kwon			Smart meter for electricity			Yes	9 SM opposite apartment wall
Address:			Power lines			Yes	Underground
Date: 09/18/17							
Number of rooms (sleeping locations): N/A							
Reference values	No Concern		Slight Concern		Severe Concern		Extreme Concern
AC ELECTRIC FIELDS (Low Frequency, ELF/VLF)	< 1 V/m		1 - 5 V/m		5-50 V/m		> 100 V/m
RADIO FREQUENCY RADIATION (High Frequency, Electromagnetic Waves)	< 20 μV		20 - 50 μV		50 - 100 μV		> 100 μV
Transient & Harmonic (Load Transient Response) (Power system harmonics)	< 0.1 $\mu W/m^2$		< 0.1 - 10 $\mu W/m^2$		< 10 - 1000 $\mu W/m^2$		> 1000 $\mu W/m^2$
	< 50 GS units		Safe amount for human exposure				

	Without electric power			With electric power		
	GS HF 35C 800MHz-2.5GHz $\mu W/m^2$	HF Digimeter 0 - 4GHz μV	AC LF NF Digimeter 60Hz V/m	GS HF 35C 800MHz-2.5GHz $\mu W/m^2$	HF Digimeter 0 - 4GHz μV	AC LF NF Digimeter 60Hz V/m
Master Bedroom	1500 SM & WiFi upstairs	120	41 120 t/wall	> 2000 SM & WiFi pulses	205	155
Living room	1.9	80	0.19	1.4	70	0.26
Dinning room	0.4	80	0.27	2.5	80	0.26
Kitchen	0.2	10	0.19	9	80	67

(Ritter, 2017)

The absorption of an estimated amount of 205 micro Volts, of frequencies between 800MHz and 8GHz as background fields, 155 Volts per meter of low frequencies at 60Hz during the time a person is lying on the bed in the sleeping location marked as master (the usual sleeping location, according to the initial interview). The absorption of transients and harmonics is no less than 240 GS units. The highest amount of these 3 frequencies combined, happened during the time of sleeping. During the time of the assessment, when the electric power was off, the readings of low frequencies, transients and harmonics where 0. The only absorption remained: was the background high frequencies 120 microVolts, and low frequencies 41Volts over meter square (Ritter, 2017).

Through my measurement, I learned my kitchen area had the lowest exposure and my bedroom had the highest due to wifi cable placement. Then what can I do with all these information? Reduce/minimize exposure especially when you are at home. For my case, even if I had turned everything off, I was still getting wifi signals from my upstairs neighbors so best solution for me was to get an EMR protection veil that looks like a mosquito net. Each apartments and homes have different conditions and EMF pollution depending on the surroundings and the buildings.

These are some of EMF specialist Dr. Ritter suggested to do to help:

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- Remove electronics in the bedroom
- Unplug unused appliances
- Turn off circuit breakers: get demand switch if you don't want to do it manually
- EMR protection veil for the bed to block High Frequencies up to 40 db
- EMF protection paint
- Grounding
- EMR protective cell phone cases and other protective gears
- Put your cell phone on airplane mode when possible
- Lower the amount of dirty electricity with GS Filters
- Hydration: optimally Oxidation Reduction Potential (O.R.P.) -500 or less
- For accurate measurements and protocols get assessed by a local professional: EMF Knights (emfknights.net) in Austin, TX.

Some other additional things we could do are:

- Supplement with Magnesium
- Eat foods high in antioxidants and anti-inflammatory properties
- Earthing/spending time in nature
- Lifestyle consistent with Chinese Medicine and Taoist Philosophy

The conclusion of this report is that there are plenty of research out there regarding EMF/EMR and its dangers are very alarming, yet often unnoticed because most of the times it is invisible to our naked eyes. Some of the health effects included insomnia, DNA damage, Autism, ADHD, migraines, Parkinson's disease and cancer. Thus, individuals have to be mindful of their wireless electronic usages and their home environment.

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