ARTICLE: **Things You Can Do Now to Reduce Electromagnetic Fields in Your Home**

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During the pandemic, we have become increasingly dependent on our technology. Many are working from home; our children may still be experiencing school or college via distance learning. We are all regularly exposed to electromagnetic fields (EMFs)—not only when we're out in public, but also inside your home. Most of the radiation emits from our cell phones, cell towers, computers, and Wi-Fi. The tremendous time-saving aspects of these amenities (made obligatory via the lockdowns) have transformed life as we know it, providing enormous conveniences. But at what cost?

Just in the last 13 years, the progress- from laptops, phones, and tablets, then to ubiquitous Wi-Fi, the smart meter, wearable tech, and now, the internet of things- has been breathtaking. There are even plans, in full implementation, to cover our planet with electro-magnetic radiation via satellites. The goal of Space-X in conjunction with some other space companies is to launch more than 42,000 satellites into near orbit circling the globe with the intention of enveloping every patch of earth in electrosmog, making avoidance of EMFs nearly impossible. At the time of this writing, there are 1000 of these satellites that Space-X alone has put into active orbit. [1]

What exactly are Electro-Magnetic Fields (EMFs)?

There are many different types of EMFs each with its own frequency (measured in units of Hertz (Hz)). EMFs come from natural sources such as lighting, sunlight, and manmade sources such as cell phones, Wi-Fi routers, electrical wiring, and microwaves. They exist in a spectrum, from extremely low frequency (3 Hz-300 Hz) all the way to gamma rays which have a frequency greater than 10^{22} Hz. (5)

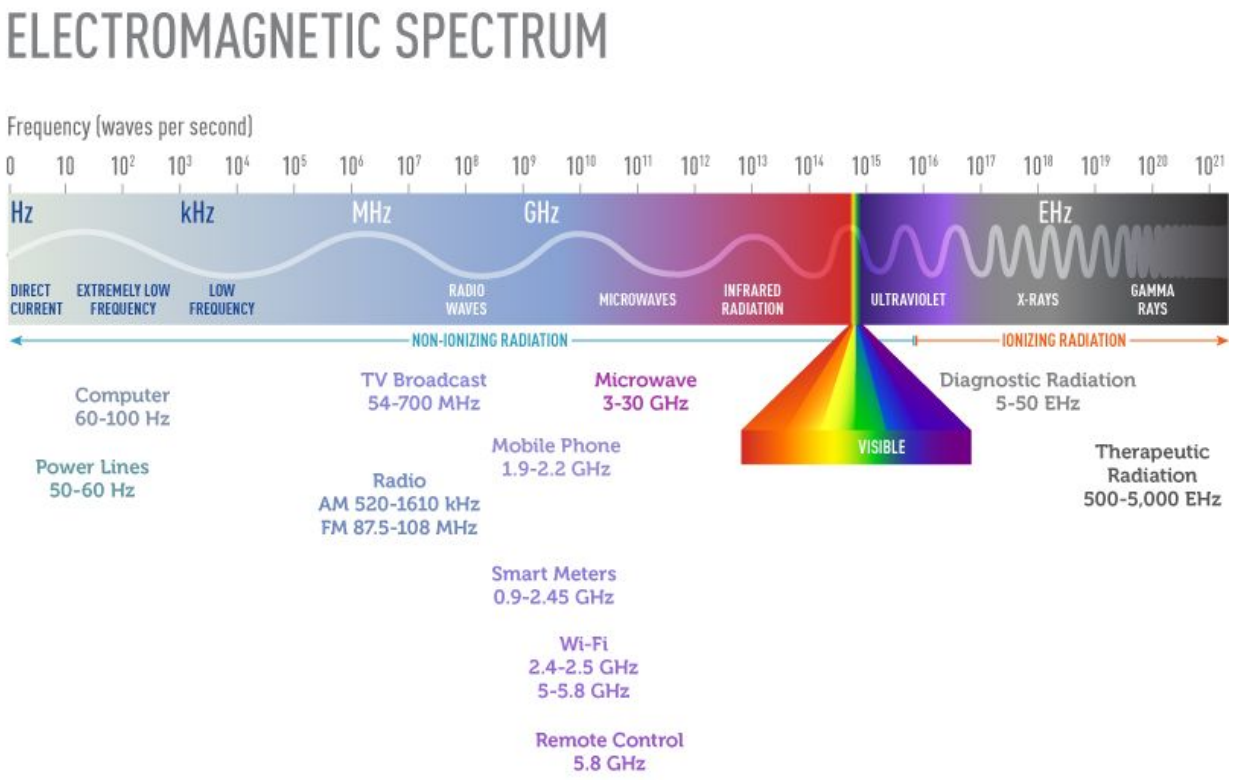

Figure: The spectrum of EMFs.[4]

EMFs are classified into non-ionizing radiation and ionizing radiation. Dr. Joseph Mercola in his book, “EMF*D: 5G, Wi-Fi & Cell Phones: Hidden Harms and How to Protect Yourself” defines Ionizing to mean that the particular EMF has the energy to disrupt the structure of an atom by knocking off one or more of its tightly bound electrons, transforming that previously neutral atom into an ion with a positive charge. Examples are neutrons from radioactive elements like uranium, alpha particles, beta particles, x-rays, and gamma rays.

He defines non-ionizing EMFs as those that do not have enough energy to create ions and thus have been generally regarded as safe and biologically harmless for decades. He goes on to mention that efforts have been made to distort findings; there’s proof that nonionizing EMFs (except for visible light and infrared light) have the ability to cause great harm to your health. He goes on to say that both ionizing and non-ionizing radiation damage DNA (just via different means). For more information on this see the **Educational Resources** and **References** at the end of this article.

Non-ionizing radiation can damage our DNA ...and more

Our daily environment is now swimming in an invisible electro-smog made up of electromagnetic fields (EMFs). There are a number of ways these EMFs are harmful to us. Excessive EMFs can cause damage in the form of excess free radicals (oxidative damage) that can damage the tiny organelles in our cells called mitochondria. If you recall from high school biology, these mitochondria are throughout your brain and body (with the exception of our red blood cells) and manufacture energy in the form of Adenosine triphosphate (ATP). EMFs are one of the primary sources of oxidative damage. According to Martin Pall, Ph.D., the ultimate cause of the 8 main health dangers of EMFs, is the intracellular influx of calcium caused by EMF signals hitting the voltage-gated calcium channels that are embedded in all the cell membranes, the highest density of these is in your brain and in the nervous tissue in your heart, your pacemaker. **These voltage-gated calcium channels are 7.2 million times more sensitive to EMF** than the charged particles inside and outside the cells in the aqueous region.[8] This is an extremely important point because present safety standards are based on these charged particles *in the aqueous region* that vibrate when they're exposed to EMFs causing *thermal damage*. The thermal damage is measured giving rise to present FCC safety standards. Thus, the safety standards are off by a factor of 7.2 million. And when these voltage-gated calcium channels are activated, it's not only the excess calcium that causes damage but the calcium influx also triggers important biological signaling to many enzymes and protein[7,8] including the most harmful aspect, which is the production of peroxynitrite, one of the most damaging molecules in your body. Peroxynitrite damages so many vital tissues such as your cell membranes [14,15], proteins [14,15], mitochondria [14,15], stem cells[14,5] and DNA [5,14,15,] thus leading to cancer. One comprehensive review funded by the National Institutes of Health (NIH) documents how elevated levels of peroxynitrite causes extensive cellular damage that disrupts at least 97 critical biological processes and, as a result, are associated with more than 60 chronic diseases. [14]

Some previous studies on Neurological and Cognitive Effects in Adults and Children

- The Herbert M 2013 review paper showed tremendous evidence of pathophysiological links between EMFs and autism. Findings included pathophysiological damage to core cellular processes that are associated both with Autism Spectrum Conditions (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. [6]

- The Meo 2019 study showed cognitive problems among students ages 13-16 who were exposed to high cell tower radiation for 2 years, compared to students with 5 times lower radiation exposure The results were statistically significant and showed that the students in the high exposure group had "significant impairment" in motor skills, spatial working memory and attention compared to the lower exposure group. [2]

- The Zothansiama 2017 study, showed that people living within 80 meters of a cell tower had statistically significant higher levels of micronuclei and oxidative damage, lower glutathione and antioxidant enzymes. The researchers concluded the following:

> " An imbalance between the oxidative forces and antioxidant defense systems causes oxidative injury, which has been implicated in various diseases, such as cancer, neurological disorders, atherosclerosis, diabetes, liver cirrhosis, asthma, hypertension, and ischemia...Because of the significant decrease in endogenous antioxidants and increased LOO among the exposed group, the extra burden of free radicals is unlikely to get neutralized, and these surplus ROS may react with important cellular macromolecules including DNA forming either DNA adducts or stand breaks, which may be later expressed as micronuclei once the cell decides to divide."[3]

- There have also been a number of animal and human studies demonstrating the demyelinating effect of EMFs which can be related to multiple sclerosis, seizure disorders, and glial cell tumors such as gliomas. [9,10,11]

- A landmark study in Israel showed a 50% decrease in men's fertility from 1973 to 2011 in western countries. [12] Dr. Mercola explains this trend: Men are facing a worsening trend of factors that contribute to infertility, particularly in lower sperm counts, lower sperm motility, and sperm that have irregular shapes. This is likely because a man's genitals have a very high density of voltage gated calcium channels, and men tend to keep their cell phones clipped to their waistband or in their pants pockets, very close to the genitals. [5]

Action Items to Reduce Your In-Home Impact of EMFs

While it's nearly impossible to avoid EMF exposure completely, there are practical ways to limit it. There are definitely various levels of investment into hardware and infrastructures that are available, but here are some cheap and free alternatives that can be done ***now*** to mitigate the impact of your in-home EMFs.

Buy a meter. To make these silent and invisible energy fields hearable, viewable and measurable, a meter is an important weapon in the fight against the dangers of EMFs. The 3 types of EMFs are :

> **Radiofrequency (RF)** fields come from cell phones, cell towers, Wi-Fi, Bluetooth, smartphones, different computer equipment.
>
> **Magnetic fields** (wherever there are coil motors, appliances, saunas, hairdryers)

Electric fields (wiring, circuit breakers, anything powered).

Here are 4 examples of meters that measure and detect EMFs.

⇧ Trifield TF2 Meter is less than $180. This one measures EMFs, RFs, and magnetic fields (RF range is 20 MHz to 6 GHz). [5]

⇧ Cornet ED88T Plus is less than $200 (RF range is 100 MHz to 2.7 GHz). Beware this is not an easy point and play; it gives a lot of information. [5]

⇧ Acousticom 2 Meter is less than $200. (RF range is 200 MHz to 8 GHz).[5]

⇧ Hf35c Rf Analyze is $365. (RF range is 800 Mhz to 2.5Ghz) This one is helpful for checking smart meter safety.

Pre-Sleep Routine:

The most important location for the reduction of EMFs in the home is the bedroom. You need an EMF-free sleep area to heal from the EMFs you've been bombarded by all day.

Shut off your Wi-Fi router before you go to sleep at night. It may take a few minutes for your devices to refind the network in the morning when you turn it back on. Buying a light timer and connecting it to your router outlet would make this more convenient. Measure your sleeping space with a magnetic field meter to confirm your exposure is below 1 milligauss and preferably below 0.3 milligauss.(5) You might have to move your bed to get to this range as magnetic fields are very difficult to shield for. Ideally, the RF level should be undetectable for bedrooms at bedtime.

Reduce your eye's intake of blue light 1-2 hours prior to sleep. Blue light is a powerful suppressor of melatonin production, thus negatively affecting our circadian rhythm and decreasing our sleep. Blue light may also contribute to diabetes, heart disease, obesity, and cancer.[13] Sleep quality is much improved when avoiding blue light from our devices and smart TVs 1-2 hours prior to going to sleep. There are different ways to do this. There are glasses you can buy that are blue light reducers such as the Uvex Blue Blocking Sunglasses. Or just turn off your devices. There are blue light-reducing apps however make sure they do not contain spyware.

Put your phone on airplane mode before you go to sleep at night. Be aware that no one can contact you while your phone is on airplane mode. **During the day, put**

your phone on airplane mode at various times when you know you need a rest from being contacted. This has the advantage of saving your battery life.

Do not use your phone or tablet as an alarm clock. If you need to use your phone for an alarm, put it on airplane mode first. The alarm will still go off.

Move the cordless Landline phone base out of the bedroom as far as possible. It definitely should not be in the bedroom. Think about getting a corded phone.

Daytime:

Put your phone on 3 G as much as possible, if possible.

Do not wear your smartphone on your person. You should never wear your smartphone closer than an inch of the body. This is particularly important for pregnant women. Children can put their smartphones in their backpacks. Boys and men should never carry their smartphones in the front pocket as this can affect their fertility and potential for prostate or testicular cancer. When speaking into your phone, put it on speaker and put it as far away from you as possible.

Do not wear any wearable wifi such as wireless earbuds, BlueTooth earbuds, Apple watches, watches that wirelessly monitor your steps, such as Fitbit, etc. Fitbits and any smart devices worn to measure your sleep are especially detrimental to your health.

Wire your home with cat-7 cable and hook up your computers to your modem via wiring instead of using a router. Or, if you have many devices, use a non-wireless router as an intermediary between your devices and modem. The Trendnet 4-PortBroadband Router has no Wi-Fi at all. The Netgear N750 (Model WND4300), N900 (Model WNDR4500), or AC1200 (Model R6230) are routers with switchable Wi-Fi. I suggest having a licensed electrician do this for you. The challenge with this is there are not many laptops that have the port connection for the jack from the cat-7 cable. You may have to experiment with port connections that can be added to your laptop's existing USB ports. If you do not have the time to install these cables into your walls, you can lay the cables along your floorboards. If you still are using your Wi-Fi router, you can use your EMF meter to check if you need to turn off your router prior to bedtime.

Remove "Alexa", "Echo", or buttons that order products automatically via Wi-Fi. Generally speaking, items with the descriptor of "Smart" are using wireless EMFs.

Use a non-WiFi baby monitor such as this one.
https://www.amazon.com/Monitors-Cameras-Moonybaby-Non-WiFi-Activation/dp/B07Q9Y9YY8/ref=sr_1_15?crid=3NPTG9WOQPOW2&dchild=1&keywords=non-wifi+baby+monitor&qid=1613424766&sprefix=non-wifi+%2Caps%2C230&sr=8-15

Cover or change your smart meter. If you are on the grid, it is likely that you have a smart meter on the outside of your home. Make sure all bedrooms are as far away from the smart meter as possible. These smart meters have been installed by utility companies to transmit information 24/7 365 days a year. Cover the smart meter with aluminum screening material and use a metal adjustable hoop to fasten the screening material to the smart meter and test the EMF being released from the smart meter with your EMF meter. You can also try to call your electric company and see if they will convert your meter to an analog meter. This may not be easy to do unless they have existing analog meters in the area and have employees doing meter reading already. If you live in an apartment where your unit is the one closest to the wall designated for all of the buildings' smart meters, you should think about changing this situation as soon as possible.

Replace LED bulbs with incandescent bulbs. Artificial lighting such as LED bulbs emit a fair amount of blue light [13], dirty electricity and are also turning on and off 120 times per second. Even though our brain can not detect this flicker rate, our eyes are constantly adjusting to this which can be harmful to our Hypothalamus-Pituitary-Adrenal axis since the nerves connecting our eye muscles to our brain are also positioned very close to the pituitary gland. Replace LED light bulbs with incandescent 100, 150-watt bulbs ideally, to reduce that flicker. Incandescents also provide a more full-spectrum so you're getting that near-infrared therapy indoors, as you would outdoors, more than you would with LEDs. [5]

Use a metal shield, such as a cookie sheet to protect your lap from the irradiation coming from your laptop or tablet. You can also buy an EMF shielding blanket, but a cookie sheet is less expensive. This is an important thing to do for our children who are distance learning and not using a desk as protection of their reproductive system.

Avoid charging your devices (laptops, tablets, phones) while you or your children are holding or using them. Try to do this after the children are in bed.

Educational Resources

Given the number of EMFs that bombard you all day long, getting educated about the negative effects of EMFs is imperative. The harmfulness of EMF and wireless radiation is well established. For more information, there are a tremendous amount of resources. Here are some to start:

- https://ehtrust.org/resources-to-share/
- https://www.saferemr.com/2019/07/international-scientist-appeal-on.html
- https://naturallyrecoveringautism.com/2019/05/13/autism-and-electromagnetic-field-interference-with-dr-martin-pall/

- https://mdsafetech.org/new-legislation-small-cell-towers/
- https://smartmeternewsupdates.wordpress.com/2018/03/08/studies-myelin-damage-from-radiofrequency-radiation/
- https://principia-scientific.org/petition-26000-scientists-oppose-5g-roll-out/
- https://bioinitiative.org/
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