Generation Zapped

STORY AT-A-GLANCE

- The primary hazard of cellphone radiation is systemic cellular and mitochondrial damage, which threatens health in general and can contribute to any number of health problems and chronic diseases
- Three recent studies add strength to the claim that long-term, heavy cellphone radiation can trigger cancer. EMFs also impair reproductive function in men and women, and have neurological effects
- Serving as an illustrative warning is the case of a young woman with no risk factors for cancer who developed multifocal breast cancer directly beneath the area where she'd been tucking her cellphone into her bra
- Risk factors for electromagnetic hypersensitivity include spinal cord damage, whiplash, brain damage, concussion, chemical and heavy metal toxicity, impaired immune function and bacterial or parasitic infections such as Lyme
- You can reduce your exposure by shutting off your Wi-Fi at night, keeping cellphones away from your sleeping area, using the speaker phone and not carrying your cellphone on your body

By Dr. Mercola

Mankind evolved on a planet where background microwave radiation was infinitesimal. Today, most live in a sea of microwave radiation and radiofrequencies (RF) emitted from wireless technologies — routers, smartphones, tablets, baby monitors, smart TVs, appliances, smart meters and more.

Globally, there are now more than 6 billion cellphone subscriptions, which means we're nearing the point where every single person on the planet has one of these devices, and most now get their first cellphone or tablet at a very early age.

According to the Pew Research Center, 90 percent of adults say their phone is frequently with them and rarely turned off.[1] Americans are so attached to their smartphones and social networks that they check Facebook and Twitter an astounding 17 times each day on average, and many teens spend a mind-boggling nine hours a day on social media.[2]

Many experts now warn that chronic, heavy exposure to these electromagnetic fields (EMFs) could be having severe repercussions for our health, especially that of children, who are being exposed in utero.

Fetuses and young children have never before been exposed to this level of pulsed radiation, and it's still too early to determine the exact extent of the harm, as it may take decades for effects to manifest.

In recent years, it's become increasingly clear that mitochondrial dysfunction is at the root of most chronic disease, so in terms of public health, the effects of chronic EMF exposure may be far more profound than currently suspected.

We may not only face an avalanche of brain cancer in coming decades, but also heart disease, neurological disorders, infertility and newly identified disorders such as electromagnetic hypersensitivity (EHS).[3,4]

Generation Zapped

The featured documentary, "Generation Zapped," investigates the potential health consequences of today's wireless world, noting microwave radiation "is a very real environmental pollutant."

The film opens up with the late Martin Blank, Ph.D., who was an associate professor of physiology and cellular biophysics at Columbia University, who points out one of the most obvious reasons EMFs may cause physical harm, and that is because your body is bioelectrical. Many of your bodily processes involve the transmission of electric signals, and external interference can disrupt those signals.[5]

As explained by Dr. Jonathan Samet, director of the Institute for Global Health at the University of Southern California, radiation can be divided into ionizing radiation and nonionizing radiation, the former having sufficiently high energy to break up molecules as it passes through your tissues.

EMFs have much lower energy, which is why the cellular industry has insisted cellphones and other wireless technologies have no biological effects. Alas, mounting science reveals this simply isn't true.

Evidence of Carcinogenicity

The mobile industry's own research in the 13-country Interphone study[6] showed a 40 percent increased risk of brain cancer from 1,640 or more hours of cellphone use, and independent Swedish research published in 2007 showed a 540 percent increased risk of brain cancer from greater than 2,000 hours of cellphone use.[7]

An analysis of known mechanisms of action, including DNA effects, was also published in November 2010 in "Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter."[8]

Importantly, EMFs have been shown to increase oxidative stress, which can damage cell membranes and proteins, and break DNA bonds. EMFs also decrease ATP — the energy currency in your body, without which your cells cannot function properly.

Samet is familiar with the evidence against cellphone radiation, having served as chairman of the International Agency for Research on Cancer working group, which in 2011 classified RF-EMFs as a Class 2B "possible human carcinogen"[9] based on the available evidence.

At the time, Samet said,[10] "The conclusion means that there could be some risk, and therefore we need to keep a close watch for a link between cell phones and cancer risk." Since then, the evidence has only grown stronger. Most recently, two government-funded studies[11,12,13,14,15] — one on mice and one on rats — found evidence of heart tumors and damage to the brain and DNA.

This $25 million research, conducted by the National Toxicology Program (NTP) is said to be the most extensive to date, and it confirms that the heart and brain are key areas affected by high, chronic EMF exposure.

The connection between cellphone radiation and cancer became even stronger when the respected Ramazzini Institute in Italy published its lifetime exposure findings,[16] effectively duplicating the NTP's findings.[17,18,19]

According to Fiorella Belpoggi, director of research at the Ramazzini Institute and the study's lead author, RF radiation from cellphones should probably be classified as a "probable" human carcinogen rather than a "possible" carcinogen.[20]

Carrying Your Cellphone on Your Body Is a Dangerous Habit

The filmmakers interview a woman named Donna, who developed multifocal breast cancer after habitually carrying her cellphone tucked into her bra. She had no family history or other predisposing risk factors for breast cancer.[21]

Two cancer specialists, Robert Nagourney and John West, concluded her cellphone was the most likely cause, as the distribution of the cancerous cells lined up perfectly with the shape of her phone. Donna is far from alone in this habit. Many young women keep their phones in their bra for convenience.

As a general rule, you'll want to avoid carrying your phone anywhere on your body. Breast cancer and heart problems are but two possible outcomes when carrying your phone in your breast pocket or bra. Research published in 2009 found that wearing a cellphone on your hip may weaken your pelvis.[22]

Using an X-ray technique used in the diagnosis and monitoring of patients with osteoporosis, researchers measured pelvic bone density in 150 men who regularly carried their cell phones attached to their belts. The men carried their phones for an average of 15 hours each day, and had used cell phones for an average of six years.

The researchers found that bone mineral density was lowered on the side of the pelvis where the mobile phones were carried, raising the possibility that bone density could be adversely affected by cellphone radiation.

Cellphone Radiation Affects Fertility and Can Triple Risk of Miscarriage

Studies have also linked RF-EMF exposure and impaired fertility in men, finding it lowers sperm count and the quality and motility of sperm.[23,24] One such study, published in PLOS One[25] found that:

"RF-EMR 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 well-being of their offspring."

Wi-Fi equipped laptops have been linked to sperm DNA fragmentation after just four hours of use.[26]Blank also cites research suggesting cellphone radiation creates DNA mutations in the sperm, and that these mutations appear to be yet another factor contributing to autism.

Pregnant women are also exposing their unborn children to harmful radiation by carrying a cellphone on their body, or using it near their body, which can alter the cellular programming in, and viability of, the fetus. According to recent research, prenatal exposure to power-frequency fields can nearly triple a pregnant woman's risk of miscarriage.[27] Several other studies have also linked prenatal EMF exposure to an increased risk of miscarriage.[28,29,30,31,32]

Electromagnetic Hypersensitivity on the Rise

As noted in the film, the average person is now bombarded with 1 quintillion times more EMFs than a decade ago, and with this dramatic increase in exposure, more and more people are starting to complain of physical effects. EHS is recognized as an environmental intolerance by the World Health Organization,[33] but many medical professionals are still skeptical about its validity.

For those suffering with EHS, however, the link is unmistakable and clear. As noted in the film, the effects of EHS are also recognizable biologically. Various lab tests can be done to show biological impairment is occurring during EMF exposure.

Dr. Dominique Belpomme, a French oncologist, conducted a study on 700 individuals with EHS, showing they suffered immune system damage and nervous system damage. He also established a number of other biomarkers for EHS. However, this kind of information has yet to pervade the medical field.

Certain Health Conditions Can Raise Your Risk of EHS

Magda Havas, Ph.D., associate professor at Trent University in Canada, has studied people with the condition, and she says a number of conditions can increase your risk of EHS, including:

Spinal cord damage; whiplash	Brain damage; concussion
Chemical toxicity, such as high levels of mercury, lead, PCBs or other neurotoxins	Bacterial and/or parasitic infections such as Lyme
Impaired immune function; lupus	The very young and the very old

Researchers have also found a significant association between tinnitus and EMF hypersensitivity, hinting at a shared pathophysiology between the two conditions.[34] In this study, nearly 51 percent of EMF hypersensitive patients had tinnitus, compared to just 17.5 percent of controls. According to the authors:

"An individual vulnerability probably due to an overactivated cortical distress network seems to be responsible for both electromagnetic hypersensitivity and tinnitus. Hence, therapeutic efforts should focus on treatment strategies (e.g., cognitive behavioral therapy) aiming at normalizing this dysfunctional distress network."

Various forms of energy medicine,[35] where you're strengthening your body's innate electrical system and meridian network, may also be a crucial EHS treatment component. By boosting your body's resilience against EMFs, many troublesome symptoms may be lessened or eliminated, making it easier to live a normal life.

That said, it's important to realize that just because you cannot feel the effects of EMFs does not mean you're unaffected on a cellular level. Whether you feel it or not, damage is occurring in everyone. In one sense, people with EHS have an advantage, as the distinct discomfort makes them take proactive steps to avoid exposure, while everyone else remains oblivious.

Your Heart and Brain Are Most Susceptible to EMF Damage

Two of the organs that are the most vulnerable to outside RF interference are your heart and your brain. Both of these organs also have the highest density of voltage gated calcium channels (VGCCs).

Research.[36,37,38,39] by Martin Pall, Ph.D., Professor Emeritus of biochemistry and basic medical sciences at Washington State University,[40] suggests VGCCs are activated by low-intensity EMFs such as those emitted from cellphones, triggering an excessive influx of calcium into the cell.

The excess intracellular calcium and the increased calcium signaling appear to be responsible for most, if not all, of the biological effects associated with EMF exposure, which include an increase in:

Neuropsychiatric disorders and diseases such as anxiety, depression, ADHD, autism and Alzheimer's[41]	Hormonal effects
Cardiac effects	Chromosomal breaks
Impaired fertility especially in men	Oxidative stress
Changes in calcium signaling	Cellular DNA damage
Breakdown of the blood-brain barrier	Cancer
Melatonin depletion	Sleep disruption

Breaching Safety Limit on Your Cellphone Increases Health Risks

In addition to the damage incurred by the EMFs noted above, cellphones also have a safety limit, beyond which you may suffer heat-induced cell damage. This safety limit, known as the specific absorption rate (SAR), is typically buried in the legal section of your phone, but will state the distance from your body required in order to prevent overexposure.

There's no cellphone on the market that is safe to directly touch your body unless it's turned off or in airplane mode, which suspends RF signal transmissions. Making matters worse, the Federal Communications Commission bases its thermal safety standards on a model that does not apply to the population at large, especially children.

The standards are based on a model called "standard anthropomorphic man," a model much larger than the average person. The larger the body, the shallower the penetration of the radiation, so SAR levels are likely too generous for most users.

Keep in mind, though, that the SAR value has no bearing on safety in terms of the nonthermal damage that occurs. According to Pall, the safety standards — which are based on thermal damage, not molecular biology — are off by a factor of 7 million.

Will the World Heed the Warnings in Time?

While awareness of the risks is growing around the world, very little is being done on a governmental level to protect citizens from mounting, and many times unnecessary, EMF exposure. Signs of hope can be seen here and there, though. For example, while France was an early adopter of wireless technology, it is now one of the first nations to ban cellphones in schools. The film also delves into related issues such as:

- The dangers of smart meters
- The rollout of 5G, which will exponentially increase EMF exposures as it will require the installation of small antennas every 250 feet or so to ensure connectivity
- The adverse impact of screen technology on sleep
- Internet addiction and the social detriments of being glued to your cellphone. For children and teens in particular, this has ramifications that go well beyond physical health

How to Reduce Your EMF Exposure

While the risks may be significant, these technologies have become too embedded in our everyday lives to get rid of them. They can, however, be made safer, and we as consumers can use them more safely. Here are several suggestions that will help reduce your EMF exposure:

Connect your desktop computer to the internet via a wired Ethernet connection and be sure to put your desktop in airplane mode. Also avoid wireless keyboards, trackballs, mice, game systems, printers and portable house phones and opt for wired versions.
If you must use Wi-Fi, shut it off when not in use, especially at night when you are sleeping. Ideally, work toward hardwiring your house so you can eliminate Wi-Fi altogether. If you have a notebook without any Ethernet ports, a USB Ethernet adapter will allow you to connect to the internet with a wired connection.
Shut off the electricity to your bedroom at night. This typically works to reduce electrical fields from the wires in your wall unless there is an adjoining room next to your bedroom. If that is the case, use an EMF meter to determine if you also need to power down the adjacent room.
Use a battery-powered alarm clock, ideally one without any light. I use a talking clock for the visually impaired.[42]
If you still use a microwave oven, consider replacing it with a steam convection oven, which will heat your food as quickly and far more safely.
Avoid using “smart” appliances and thermostats that depend on wireless signaling. This would include all new “ smart” TVs. They are called smart because they emit a Wi-Fi signal, and unlike your computer, you cannot shut the Wi-Fi signal off. Consider using a large computer monitor as your TV instead, as they don’t emit Wi-Fi.

Refuse smart meters as long as you can, or add a shield to an existing smart meter, some of which have been shown to reduce radiation by 98 to 99 percent.[43]
Consider moving your baby's bed into your bedroom instead of using a wireless baby monitor. Alternatively, use a hard-wired monitor.
Replace CFL bulbs with incandescent bulbs. Ideally remove all fluorescent lights from your house. Not only do they emit unhealthy light, but more importantly, they will actually transfer current to your body just being close to the bulbs.
Avoid carrying your cellphone on your body unless in airplane mode and never sleep with it in your bedroom unless it is in airplane mode. Even in airplane mode it can emit signals, which is why I put my phone in a Faraday bag.[44]
When using your cellphone, use the speaker phone and hold the phone at least 3 feet away from you. Seek to radically decrease your time on the cellphone. I typically use my cellphone less than 30 minutes a month, and mostly when traveling. Instead, use VoIP software phones that you can use while connected to the internet via a wired connection.

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