

Minimizing the Long-Term Effects of EMFs From Cell Phone Use

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In our society, we thrive on convenience and technology for instant gratification. Products are put on the market to assist our "quality of life," thus increasing what is considered to be convenient. Cell phones have made it more convenient to communicate, work and live. To no surprise, our society has become addicted to the use of this technology, leaving us feeling that we cannot live without them.

From a public health standpoint, the electromagnetic fields (EMFs) generated by cell phones affect biological tissues and create disease, putting millions of people at risk. Currently, *prudent avoidance* is the jargon used, which means "the concept of protecting yourself from exposures that are probably but not definitely harmful, if the actions required are neither unreasonably expensive nor disruptive." Medically, the dilemma is that no solution or treatment is implemented until after the disease has occurred. Politically, it is considered a low priority unless it affects the popular opinion of voters. Legally, unless proven with testimony by an educated "expert" with replicated evidence-based knowledge, it is deemed credible and/or valid - but not replicated - observational common sense. In academia, when these replicated possibilities become proven, then it must be correct. Thus, anyone with a differing possibility is wrong because it does not fit the academic model of proven theory, which became the "law" rather than a "work in progress" to build upon.

The goal of this article is to propose a solution to assist in preventing the inevitable by anticipating and treating what might happen before it does. Chinese medicine and many other indigenous medical systems are solutions before rather than after the fact. The dilemma is: How can you provide evidence-based research on something that has not happened yet? Integrate evidence-based replicated research with preventative medical systems as Chinese medicine. This will not stop disease completely, but by counterbalancing the effects, will provide a better quality of life.

Public Health Perspective

Public health's primary role is the protection of the population as a whole, funded by the federal government. However, in order for public health to be alerted, it must affect a significant number of the population or the disease is highly contagious. The dilemma remains today that statistical analysis of diseases related to EMF goes widely undocumented over time and did not get attention until law suits were initiated. The initial cases lost due to lack of evidence and/or research that would substantiate the claim. The consequences of EMFs in our environment are not obvious and therefore are not protected by the unofficial EMF exposure limit of 10,000 $\mu\text{W}/\text{cm}^2$.

EMF Waves

EMFs are all around us in any object that has an electrical charge. These are invisible lines of force that surround all wiring and electrical instruments. Emissions from radio and microwave frequencies, as well as electromagnetic radiation from extremely low frequencies, are harmful to all living things. The strength of these fields varies from indoors to outdoors along with the

individual's surrounding environment, which changes on a daily basis.

Humans and EMF Waves

As bioelectrical machines, humans operate at between 2 and 20 Hz. Typical currents within households are in approximately the 60-Hz range. This challenges the body's natural electrical frequency by continually penetrating the entire body and disrupting homeostasis within neural transmission and neuroendocrine equilibrium, thereby accelerating and/or increasing the risk of specific disease processes.

The following information is documented:

- 1972 - In Russia, switchyard workers who were regularly exposed to high levels of EMFs experienced increased behavioral changes, cancer, brain tumors, leukemia and epilepsy. Other health-related outcomes included high blood pressure, immune system depression, chronic stress effects, and changes in red- and white-blood cells, headaches, chronic fatigue and increased metabolism.
- 1979 - Epidemiologist Dr. Nancy Wertheimer established a connection between low-voltage power lines in residential neighborhoods and instances of childhood leukemia.
- 1989 - Dr. Janet Healer gave a report to the Congressional Office of Technology Assessment, stating, "Studies over the last 15 years have demonstrated unequivocally that under certain circumstances, the membranes of cells can be sensitive to even fairly weak, externally imposed low-frequency electromagnetic fields. Extremely small signals can trigger major biochemical responses critical to the functioning of the cell."
- 1990 - The EPA (Environmental Protection Agency) conducted a comprehensive investigational review of EMF studies. They published a report recommending that power line EMFs, radio waves and microwaves be declared possible carcinogens.
- 1996 - The U.S. Federal Court ruled that citizens may not bring suit against electric power companies over electromagnetic radiation emissions.

Let's Talk Cell Phones

The biggest domestic appliance in our society currently is cell phones. This also happens to be the most frequent source of radiation ever invented. Cell phones emit EMF waves that are in the microwave frequency, which is considered ultra-high frequency and is maximally absorbed into human tissues. The entire phone radiates EMF waves when held to the ear, which penetrates the brain. The repercussions include creating DNA damage to cells causing and/or contributing to headaches, tumors, various brain cancers and loss of hearing.

Cell phones do have a specific absorption rate (SAR) (the measure of the amount of energy absorbed by the body in an RF field). FCC exposure limits are within 1 mw/cm² (the unit used to measure the intensity of RF EMFs) for public exposure and 5 mw/cm² for workers. SAR limits for devices operating close to the body such as cellular phones is 1.6 watts/kg as measured over 1 gram of tissue. The current regulations of SAR are based only on the thermal effects. This does not address non-thermal effects that penetrate the brain. Presently, scientists have identified that 70 percent of cell phone EMFs penetrate the brain.

The Cellular Telecommunications Industry Association (CTIA) maintained that cellular phones are safe and meet the standards adopted by the U.S. government. However, in 1993, the Wireless Technology Research (WTR) organization was established to monitor health risks from using wireless communications technology (funded by the CTIA). In 1999, Dr. George Carlo (head of the WTR) presented information to the chairman and CEO of the AT&T Corporation concluding that there was:

- an increased rate of death from brain cancer;
- an increased risk of neuroma of the auditory nerve;
- twice the risk of rare neuroepithelial tumors on the outside of the brain;
- a correlation between right-side brain tumors and the use of the phone on the right side of the head; and
- enough radiation coming from a phone antenna to cause functional genetic damage.

Delaying the Onset with Oriental Medicine

Obviously, it is human nature to not give up the comforts of convenience within our society. However, it is reasonable to say that many individuals would prefer to know the potential risks. As more research is implemented, we may follow in the footsteps of Switzerland, where the government imposed restrictions on cell phone power level emissions that are substantially lower than the U.S. standards. There also are other means to take a preventative stance, using Chinese medicine.

One of the first physiological manifestations associated with cell phone use seems to be hearing loss, usually in the ear that is always used. Usually over time this is a result of deficiency, specifically of the kidney due to its subtle nature. Pre-existing conditions of deficiency also may be aggravated with cell phone use, exacerbating these conditions over time. These deficiencies include kidney *yin/yang* deficiency, spleen *qi* deficiency and *qi* blood deficiency. The kidney opens into the ear and the *qi* is important for both processing and protecting the ear. Although associated with aging, other variables include overwork (especially under stress), stimulant drugs (affects the kidney *yin*), among many others.

When dealing with cell phones and EMFs, an analysis progresses from kidney *yin* deficiency to kidney *yang* deficiency, depending upon individual pre-existing TCM diagnostic patterns. With this information it then becomes paramount to anticipate what TCM pattern direction is diagnosed, and treat accordingly. Typically, those individuals who are highly stressed would exacerbate their condition with cell phone use so to counterbalance this potential pathology, some TCM patterns of differentiation would be Liv *qi* stagnation can develop into Liv fire, or Liv *yin* deficiency with *yang* rising in acute cases. Chronic cases Sp *qi* deficiency can further develop into *qi*/blood deficiency; K *yang/yin* deficiency.

In extreme cases, individuals just blow off the symptoms as being the "normal" part of their job and/or daily life. However, these TCM patterns actually are precursors to further developing diseases as mentioned earlier (cancer and leukemia). Our society is not aware of this yet, as the understanding of TCM tends to still focus around pain management as the evidence-based model of how acupuncture works. In actuality, this accepted model is such a small part of the theories used within TCM. The mindset within this article is not really new. It is just being reintroduced as preventive, using a TCM diagnostic method which has already given us insight into pre-existing conditions that need to be counterbalanced.

A wide variety of acupuncture points and formulas could be implemented, depending on individual TCM diagnosis. The key to treatment using this method is to not only be aware of the immune system but other underlying factors that are caused or aggravated by long-term direct EMF exposure to the ear.

Here are some examples of TCM patterns that may be identified with these patients. For Liv *qi* stagnation one could use Liv3, LI4, GB20, SJ17, SI19 with *Xiao Yao San*. For Liv fire one could use Liv3, GB34, SJ3, SJ5, Liv2, LI5, along with *Long Dan Xie Gan Wan*. If the individual has Liv *yin* deficiency with *yang* rising, then add the following points to your prescription: K1, K3, UB18, UB23

with *Tian Ma Gou Teng* and *Zhen Gan Xi Feng Tang*. If the patient has K deficiency, one can use R4, D4, K3, St36, UB23, UB62, SI3, SJ17 for K yang deficiency with *Bu Gu Zhi Wan*. If the patient has K yin deficiency then you might want to include K3, K6, K7, GB2, LG7, SI19 and UB23 with *Er Long Zuo Ci Wan*. With Sp qi deficiency, use R12, St36, St40, Sp6, Sp9, LG7, SJ17, GB20, SI19, along with *Bi Zhong Yi Qi Tang*. If a patient has pre-existing qi/blood deficiency then use UB15, UB17, UB20, UB23, St36, Sp6, R12, GB2, SJ17, along with *Shi Quan Da Bu Tang*. Again, these are just examples; there are many other points and formulas that can be used. The key is your individual TCM diagnosis for your patient, in addition to points that have been suggested. Formulas will need modification, depending upon the TCM diagnostic findings of your patient.

Oriental medicine can play a pivotal role in prevention and the delay of more serious conditions associated with the long-term effects of cell phone use. Using an acupuncturist anticipates the direction of the diagnosis, in order to prevent and counterbalance the associated condition. This is what Oriental medicine has to offer beyond the limited viewpoints of the neuron doctrine and pain management.

Homeostasis is about adaptations; we can fine-tune these adaptations and counterbalance the effects of EMF waves in the early-to-moderate stages. Technology will keep advancing; we should also keep advancing within the preventive medicine model by raising awareness of possible options and creating a solution through education and integration of medical, academic and scientific disciplines. From a public health standpoint, keeping patients healthy is more cost-effective in the long run. The ultimate goal, as reiterated in the professional peer-reviewed literature, is to provide efficient and cost-effective individualized care for improved quality of life.

Resources:

- DA Savitz, et al. Case-control study of childhood cancer and exposure to 60-Hz magnetic fields. *Am J Epidemiol*, 1988;128:21-38.
- SJ London, et al. Exposure to residential electric and magnetic fields and risk of childhood leukemia. *Am J Epidemiol*, 1991;134:923-37.
- MP Coleman, et al. Leukemia and residence near electricity transmission equipment: a case-control study. *Br J Cancer*, 1989;60:793-8.
- JR Jauchem, JH Merritt. The epidemiology of exposure to EM fields: an overview of the recent literature. *J Clin Epidemiol*, 1991;44:895-906.
- DA Savitz, EE Calle. Leukemia and occupational exposure to EM fields: Review of epidemiological studies. *J Occup Med*, 1987;29:47-51.
- GK Livingston, et al. Reproductive integrity of mammalian cells exposed to power frequency EM fields. *Environ Molec Mutat*, 1991;17:49-58.
- M Rosenthal, G Obe. Effects of 50-Hertz EM fields on proliferation and on chromosomal aberrations in human peripheral lymphocytes untreated and pretreated with chemical mutagens. *Mutat Res*, 1989;210:329-35.
- A Rannug, et al. A study on skin tumor formation in mice with 50 Hz magnetic field exposure. *Carcinogenesis*, 1993;14:573-8.
- S Baumann, et al. Lack of effects from 2000-Hz magnetic fields on mammary adenocarcinoma and reproductive hormones in rats. *Bioelectromag*, 1989;10:329-33.
- RK Adair. Constraints on biological effects of weak extremely-low-frequency electromagnetic fields. *Phys Rev A*, 1991;43:1039-48.
- MN Bates. Extremely low frequency electromagnetic fields and cancer: the epidemiologic evidence. *Environ Health Perspec*, 1991;95:147-56.
- JG Davis, et al. Health Effects of Low-Frequency Electric and Magnetic Fields. Oak Ridge Associated Universities, 1992.
- J Walleczek. Electromagnetic field effects on cells of the immune system: The role of calcium signaling. *FASEB J*, 1992;6:3177-85.

- GL Carlo. Document Written from Wireless Technology Research LLC to AT&T Corporation, Chairman and Chief Executive Officer, Mr. C. Michael Armstrong, New York, Oct. 7, 1999.
- M-L Qiu. *Chinese Acupuncture and Moxabustion*. New York: Churchill Livingstone, 1993.
- J Ross. *Acupuncture Point Combinations*. New York: Churchill Livingstone, 1995.
- N Wiseman, A Ellis. *Fundamentals of Chinese Medicine*. Brookline, Mass: Paradigm, 1985.
- M Condeminas. "Nine Degrees of Health Risk From Electromagnetic Radiation in Mobile Telephones." European Comm. World Health Organization Conf. on Application of the Precautionary Principle to EMF. Luxembourg, February 2003.
- L Howe. "British Cell Phone Safety Alert: An Interview with Robert O. Becker, MD" 2000. Available at: [website](#).
- "Police say new digital handsets are making them ill." Ananova, July 18, 2002. Available at: [website](#).
- United States Environmental Protection Agency Office of Radiation and Indoor Air. Electric Magnetic Fields In Your Environment. 1992 Brochure. ISBN 0-16-036282-2.
- World Health Organization and National Institute for Environmental Health Science. Conference on Application of the Precautionary Principle to Electromagnetic Fields. Feb. 24-26, 2003.

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