

Effects of Electropollution On Hormones and Breast Cancer

November 2007 [Features A](#)



Dr. Sherill Sellman, ND

A defining moment in world history occurred in 1879 when Thomas Edison switched on the first light bulb. The flick of that switch radically transformed our world forever. The Age of Electricity was born.

Our love affair with all things electrical means that we now live in a dense sea of electromagnetic energy waves, called electro-magnetic radiation (EMR) which are estimated to be 100 - 200 million times greater than they were a hundred years ago!

Compounding the problem is the explosion of wireless technology like cell phones, Bluetooth, PDA's, wireless internet, WiFi and the powerful microwave emitting towers that are required for their transmission. This pervasive wireless world emits a particular spectrum of EMR that has its own damaging effects on living systems.

Within just two decades, wireless technology has exploded onto the global scene. Today, over 236 million Americans, 20 million Canadians and 19 million Australians own cell phones and over 80 per cent of the entire planet is connected to the wireless internet (by 2010, it will be 90 per cent). The hot spot phenomena, which allows for internet access in airports, hotels, coffee shops, schools and other public areas will grow to 12,400 in the U.S. and Canada by the end of 2007 and 78,000 by 2008.

Our homeostasis is now being thrown into turmoil by unprecedented levels of all forms of EMR – which seriously compromises the body's ability to properly function.

Anatomy of Electropollution 101

The 100 trillion cells of the human body communicate with each other by subtle low electromagnetic signals and through biochemical reactions. These signal pathways carry the information that becomes translated into all the biochemical and physiological processes of the body. Continuous exposure to electromagnetic radiation can drastically distort and disrupt these cellular communication pathways resulting in abnormal cellular metabolism and ultimately, disease.

Electropollution-induced biological stress profoundly compromises normal physiology and intercellular communication. Imagine the chaos that results when communication systems go down in a city. In the body, on a cellular level, a similar chaos is created when normal processes shut down and intercellular communication is disrupted. Cell function deteriorates, cell membranes harden, free radical damage occurs, nutrients can't get in and toxins can't get out. The breakdown of healthy cellular processes leads to biological chaos in our bodies.

Hundreds of studies have shown the harmful effects of EMR on the immune system (12), enzyme syntheses (13), nervous system (14), learning, moods and behavioural patterns. All aspects of life at the molecular, cellular, biochemical and physiological levels can potentially be damaged by EMR exposure.

Hormones, Cell Phones and EMRs

Hormones are powerful substances. They pack a big wallop considering the tiny amounts that are produced by the endocrine glands. Most hormones such as estrogen, progesterone, testosterone, insulin and melatonin are made in parts per billion or parts per trillion. Even small hormonal fluctuations can create major physiological changes. As profound orchestrators of all of life's processes, maintaining hormonal balance is imperative for optimum health. When delicate hormonal balance and rhythms are altered, the body's ability to regulate fundamental systems goes haywire.

Our modern lifestyle poses many threats to optimal endocrine function. Stress, toxicity, poor quality food, lack of sleep, and pharmaceutical medications are all known hormone disruptors. However, there is one particular kind of hormone disruptor that has been seriously overlooked – electromagnetic radiation.

Embedded deep within the brain is a light sensitive endocrine gland called the pineal gland which is about the size of a pea. Since ancient times, it was associated with the mystical all seeing "Third Eye". Once dismissed as a useless gland, the pineal, which is actually a light sensitive organ, is now considered to be one of the most significant glands in the body.

The pineal gland is the primary source of the hormone melatonin. Melatonin was discovered 50 years ago and is now hailed as a miraculous hormone regulating many key functions of human growth and health and providing anti-cancer protection. Melatonin is produced about 90 minutes after falling asleep. Studies have shown that blood concentrations of the hormone rise after dark from low daytime values and usually peak in the middle of the night.

Researchers are increasingly surprised at the extent of the physiological processes that are either controlled or influenced by melatonin: it regulates the circadian rhythms governing our waking/sleep cycle, and it is one of the most efficient destroyers of free radicals which ensures normal DNA synthesis and cell division. Melatonin not only inhibits the release of estrogen but also suppresses the development of breast cancer. It's other anticancer property is its ability to increase the cytotoxicity of the immune system's killer

lymphocytes. It is even able to enhance the immune system and counteract stress-induced immunosuppression.

Melatonin's breast cancer-fighting ability also addresses two other threats that can increase cell division in the breast – the hormone prolactin and the growth factor known as “epidermal growth factor”. Melatonin also enhances the tumour-fighting power of vitamin D and increases its ability to stop tumour growth. In fact, it increases vitamin D's tumour fighting abilities by 20-100 times. It also acts as an aromatase inhibitor – a powerful protection against estrogen-dependent cancers.

ELECTROMAGNETIC RADIATION AND CANCER

Needless to say, it is vital to ensure our body's ability to produce regular and adequate levels of melatonin on a daily basis. Unfortunately, sleeping in a room in which we are surrounded by all our favourite devices like cordless or cell phones, digital clocks, CD/radio players, computers and televisions can seriously suppress our nightly melatonin production.

In 2001, Masami Ishido at Japan's National Institute for Environmental Studies showed that breast cancer cells treated with melatonin would resume growing when exposed to power-frequency EMRs. (15) He found that magnetic fields disrupt the cells' signaling system – their internal communications network which determines how they respond to their environment.

In the process, Ishido also challenged one of the central tenets of mainstream toxicology: less is better and more is worse. The EMR effect he observed at 12mG was pretty much the same as the one he saw when he used a field a hundred times higher – at 1G, Ishido found indications that the effect was even stronger at the lower EMR dose than the higher one. (16)

This mechanism has helped to explain why reduced melatonin levels from EMR has been shown to cause a number of cancers including breast, prostate, colorectal, melanoma, ovarian malignancies and childhood leukemia.

It is now known that melatonin suppression occurs at frequencies not far above those of the common household ranges of 50-60 hertz. If we sleep next to a cordless phone base station, and/or digital clock, or we have faulty electrical wiring, enough continuous EMR exposures are emitted to suppress night time melatonin production.

The connection between breast cancer and EMR only gets stronger. Dr. Patricia Coogan at the Boston University of Public Health reported a 43 per cent increased risk in women with a high likelihood of occupational exposure to magnetic fields such as those given off by mainframe computers. (17) In fact, women who work in electrical jobs, including electricians, telephone installers, power line workers and electrical engineers have a greater risk of dying from breast cancer. This increased incidence has been directly linked to the suppression of melatonin from EMR.

It's not just women who should be concerned about EMR's causal link to breast cancer. In five studies, elevated EMR have been implicated in an increased incidence of male

breast cancer. Men who worked as telephone linemen, in switching stations, and in the utilities industry were found to have as much as a sixfold increase in breast cancer. (18)

More Hormone Disruption

Experimental physiologist Dr. Charles Graham's research found that magnetic fields had an effect on two other hormones. Overnight exposure of women to elevated levels of EMR in the laboratory significantly increased estrogen levels which is a known risk factor for breast cancer. (19) In men, EMR exposure reduced levels of testosterone – a hormone drop that has been linked to testicular and prostate cancers.

Graham notes that a field's steady magnitude matters less than its intermittency or other features, such as power surges called electrical transients. These surges can pack a big burst of energy into a short period of time. They occur whenever lights or other electric devices are turned on, when motors or compressors (such as those in refrigerators and air conditioners) cycle on, or when dimmer switches operate. Transients are hard to avoid because they may stem from surges elsewhere – in a neighbour's house or even power lines up the street.

He also believes that EMR may actually fit the definition of an endocrine disruptor better than many hormone mimicking environmental pollutants because magnetic fields appear to elicit their effects by acting on and through hormones, rather than as hormones.

Neurotransmitters, a special class of hormones which include serotonin and dopamine, play a major role in moods. Changes in serotonin levels are known to be associated with depression. For example, lowered levels of this chemical in the brain have been linked to an increase in suicide frequency. (22) One study examined the brain functions of monkeys exposed to 60 Hz magnetic fields. It found that the levels of serotonin and dopamine (affects brain processes that control movement, emotional response and ability to experience pleasure and pain) were significantly depressed immediately following exposure, and that only the dopamine returned to normal levels several months after. (23)

Cell Phones and Your Cell Membranes

In recent years, exposure to radio frequencies emitted from cell phones and wireless communication devices have taken front and centre stage as the cause of serious physiological damage to our cells.

Initially the Wireless Industry and the U.S. government did not consider radio frequencies from cell phones a health risk. Despite massive evidence to the contrary, the wireless industry still maintains that position. In the early days of this technology, it was believed that only a thermal effect, the heating of tissues, (such as what occurs in a microwave oven) resulted in damage to tissues. Since cell phones do not have enough power to heat tissue, the U.S. government did not require any studies investigating the potential health problems.

However, emerging science has found that the problem with cell phones does not come from power output (thermal effect) but rather from the information piggybacking on the so called 'carrier waves' emitted from and received by the antenna. This is called an

information carrying radio wave (ICRW). It is a frequency that conveys specific packets of information which allows for the transmission of various features of cell phones like voice, text graphics and others. (35)

Herein lies the problem. This ICRW is a frequency that has never before existed in nature. Our cells are totally unfamiliar with it and perceive it as a dangerous, foreign invader.

The latest research has clearly identified the biological mechanisms of harm caused by ICRWs. We have special receptor sites, called microtubules, on our cell membranes that can sense frequencies. The receptor sites interpret the ICRW as an unknown, threatening energy. Instantaneously the cell membrane will go into a protective lock down mode. This means that nutrients cannot get into the cell and toxins and waste products cannot get out. It also prevents vital cell-to-cell communication. (36) This effect is immediate and lasts as long as a person is exposed to ICRWs. The longer this condition persists the greater the biological damage, often resulting in free radical damage, genetic mutation, loss of cellular energy, premature aging and ultimately degenerative diseases.

If anyone should know about the harmful effects of cell phones and wireless technology it is Dr. George Carlo, MD, Ph.D. As a respected professor of epidemiology, Dr. Carlo was hired by the Cellular Telecommunications Industry Association (CTIA), as the chief research scientist, to lead a \$28 million five year research program investigating the potential harmful effects of cell phones. The CTIA was confident that no health effects would be discovered. However, Dr. Carlo and his team of 200 research scientists found otherwise. Upon presentation to the CTIA of his findings, he was fired and the damning results were shelved. Dr. Carlo has now become one of the most reputable and vocal critics of the wireless industry.

Dr. Carlo says: "We understand that these information-carrying radio waves trigger protein membrane responses at the cell membrane level leading to disruption of intercellular communication and build up of free radicals inside the cell. This is very important because it now explains the wide diversity of symptoms that we are seeing in patients who are reporting electrohypersensitivity and also other conditions such as headaches and unexplained anxiety that henceforth we'll know will be associated with these information-carrying radio waves." (37)

Three Pieces of the Intervention Puzzle

Resolving the electropollution problem necessitates technologies that address three distinct interventions: primary, secondary and tertiary. Dr. Carlo is adamant that all three levels of intervention are required in order to be adequately protected against electropollution. He refers to this as the Public Health Paradigm.

Primary intervention technologies are those that act to prevent the cell membrane protective response from being inappropriately triggered. These act on the "cause" of the problems and include: headsets, active noise field technology (developed by the U.S. military) and passive noise field technologies.

Secondary intervention technologies are those that act to restore intercellular communication and thus can ameliorate the “effects” of the exposure to EMR. These are most effective in conjunction with primary interventions and include: subtle energy technologies, diodes, and some pendants.

Tertiary intervention technologies are those that act to rehabilitate and correct cell damage. These work only in conjunction with primary and secondary intervention technologies and include: a nutrient rich diet and nutritional supplements like antioxidants.

To ensure the greatest protection, all three “layers” must be initiated simultaneously: protect the cells from direct harm, re-establish healthy cell-to cell communication and provide the body with the essential nourishment so it can repair itself and stay healthy.

Dr. Carlo is adamant that all three levels of intervention are necessary. “The combined effects of Electropollution covering all three effect windows is the most serious health risk we have ever faced because it is an overlay health risk that is now working insidiously in our lives. These exposures compromise fundamental biological processes including immune response and other physiological compensation systems. Thus, electropollution makes the population more susceptible and vulnerable to other environmental insults such as air and water pollution, poor nutrition, exposures to viruses and bacteria, as well as physical stressors such as extreme heat or cold and stressful life events.” (42)

As we rush headlong into our exciting high tech world, we must also understand that we are all participating in a massive experiment. Electropollution is a very real threat to present and future generations. Effective interventions are not a luxury but simply a necessity. Like it or not the ever expanding and intrusive EMR world is here to stay. The responsibility lies with each one of us to take proactive steps that will protect us, our families and future generations.

Sherrill Sellman is a naturopathic doctor, psychotherapist, international lecturer, radio host, writer, Certified Electro-magnetic Radiation Safety Advisor (CERSA) and best-selling author of *Hormone Heresy: What Women MUST Know About Their Hormones and What Women MUST Know To Protect Their Daughters From Breast Cancer*. She be contacted by email at golight@earthlink, www.whatwomenmustknow.com or at 918-437-1058.

Catch Dr. Sellman at Whole Life Expo 2007 for two lectures:

- Friday, Nov 23, 6:45pm “Getting Your Hormones Back on Track”
- Sat., Nov 24 “Electropollution, Hormones, and Cancer – What You Need to Know”.

For more information go to www.wholelifecanada.com, or see Expo Showguide in this issue.

Dr Sellman will be available after her lectures for questions and booksignings at BioPro booth 182. BioPro is a company specializing in education on safe technology and

products to protect consumers from radiation. For more information go to www.saveyourbrain.info. Also, copies of the book *Cellphones: Invisible Hazard of the Wireless Age* by Dr. George Carlo will be available for sale at the booth.

References

(1) Ilker Dibirdik, Daiva Kristupaitis, Tomohiro Kurosaki, Lisa Tuel-Ahlgren, Alice Chu, David Pond, Dong Tuong, Richard Luben, and Fatih M. Uckun, Stimulation of Src Family Protein-tyrosine Kinases as a Proximal and Mandatory Step for SYK Kinase-dependent Phospholipase C2 Activation in Lymphoma B Cells Exposed to Low Energy Electromagnetic Fields, *Journal of Biol Chem*, Vol. 273, Issue 7, 4035-4039, February 13, 1998

(2) Daiva Kristupaitis, Ilker Dibirdik, Alexei Vassilev, Sandeep Mahajan, Tomohiro Kurosaki, Alice Chu, Lisa Tuel-Ahlgren, Dong Tuong, David Pond, Richard Luben, and Fatih M. Uckun, Electromagnetic Field-induced Stimulation of Bruton's Tyrosine Kinase, *Journal of Biological Chemistry*, Vol. 273, Issue 20, 12397-12401, May 15, 1998

(3) Shaw, G.M., Croen, L.A., Human adverse reproductive outcomes and electromagnetic field exposures: review of epidemiologic studies. *Environment Health Perspectives* 1993 Dec;101 Suppl 4:107-19.

(4) Blaasaas, K.G., Tynes T., Lie, R.T., Residence near power lines and risk of birth defects. *Epidemiology* 2003; 14: 95-98.

5. Ahlbom, A., Cardis, E., Green, A., Linet, M., Savitz, D., Swerdlow, A., Review of the epidemiologic literature on EMR and health: ICNIRP (International Commission for Non-Ionizing Radiation Protection) standing committee on epidemiology. *Environ Health Perspect* 2001; 109 (suppl 6): 911-933.

6. Lyskov, E., Juutilainen, J., Jousmäki V, Hänninen, O., Medvedev, S., Partanen, J., Influence of short-term exposure of magnetic field on the bioelectrical processes of the brain and performance. *Int J Psychophysiol* 1993;14:227-231.

7. C. Graham, M. R. Cook, M. M. Gerkovich, and A. Sastre Copyright notice. Research Article - Examination of the melatonin hypothesis in women exposed at night to EMR or bright light. C. Graham, M. R. Cook, M. M. Gerkovich, and A. Sastre, *Environ Health Perspect*. 2001 May; 109(5): 501-507.

8. Havas, M., Stetzer, D., Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. Havas, M. *Electromagn Biol Med*. 2006; 25(4): 259-68

9 Savitz, D.A., Checkoway, H., Loomis, D.P. Magnetic field exposure and neurodegenerative disease mortality among electric utility workers. *Epidemiology* 1998; 9: 398-404.

10 Robert O. Becker M.D., *Cross Currents: The Promise of Electromedicine, the Perils of Electropollution*, J.P. Tarcher; 1st ed. (December 1989)

11. Sienkiewicz, Z.J., Saunders, R.D., Kowalczyk, C.I. (1991), Biological Effects of Exposure to Non-ionizing Electromagnetic Fields and Radiation II. Extremely Low Frequency Electrical and Magnetic Fields, NRPB Report R 239, National Radiological Protection Board, Chilton.
12. Saunders, R.D., Kowalczyk, C.I., Sienkiewicz, Z.J. (1991), Biological Effects of Exposure to Non-ionizing Electromagnetic Fields and Radiation III. Radiofrequency and Microwave Radiation, NRPB Report R 240, National Radiological Protection Board, Chilton
13. www.ortho.lsuhsu.edu/Faculty/Marino/EL/EL5/Summary5.html
14. Masami Ishido, Hiroshi Nitta and Michinori Kabuto, Magnetic fields (MF) of 50 Hz at 1.2 μ T as well as 100 μ T cause uncoupling of inhibitory pathways of adenylyl cyclase mediated by melatonin 1a receptor in MF-sensitive MCF-7 cells
Carcinogenesis, Vol. 22, No. 7, 1043-1048, July 2001
15. www.microwavenews.com/nc_nov2005.html
16. Girgert, R., Schimming, H., Körner, W., Gründker, C., Hanf, V., Induction of tamoxifen resistance in breast cancer cells by ELF electromagnetic fields. Biochem Biophys Res Commun. 2005 Nov 4;336(4):1144-9.
17. Patricia F. Coogan, Richard W. Clapp, Polly A. Newcomb, Thurman B. Wenzl, Greg Bogdan, Robert Mittendorf, John A. Baron, Matthew P. Longnecker, Occupational Exposure to 60-Hertz Magnetic Fields and Risk of Breast Cancer in Women Epidemiology, Vol. 7, No. 5 (Sep., 1996)
18. Paul A. Demers¹, David B. Thomas^{1,2}, Karin A. Rosenblatt^{1,2}, L. Occupational Exposure to Electromagnetic Fields and Breast Cancer in Men, American Journal of Epidemiology Vol. 134, No. 4: 340-347.
19. Charles Graham, Mary R. Cook, Mary M. Gerkovich, Antonio Sastre, Examination of the Melatonin Hypothesis in Women Exposed at Night to EMR or Bright Light, Environmental Health Perspectives, Vol. 109, No. 5 (May, 2001), pp. 501-507
20. Charles, L.E., Loomis, D., Electromagnetic fields, polychlorinated biphenyls, and prostate cancer mortality in electric utility workers, et al, University of North Carolina at Chapel Hill, NC, USA Am J Epidemiol. 2003 Apr 15;157(8):683-91.
21. J.D. Harland, M.Y. Lee, G.A. Levine, R.P. Liburdy, Differential Inhibition of Tamoxifen's Oncostatic Functions in a Breast Cancer Cell Line by 12 mG Magnetic Field, Lawrence Berkeley National Laboratory, University of California.
22. Becker R., Cross Currents. Jeremy P. Tarcher, Inc. Los Angeles, p. 208, 1990.
23. Serotonin, Suicidal Behaviour, and Impulsivity", The Lancet p. 949-950, 24 Oct. 1987

24. Becker, R. Cross Currents. Jeremy P. Tarcher, Inc. Los Angeles, p. 208, 1990.
25. Perry, F.S. et al. "Environmental Power Frequency magnetic fields and suicide." Health Physics 4: 267- 277, 1981_44) Perry, F.S., Pearl, L. "Health effects of ELF fields and illness in multistory blocks." Public Health. 102: 11-18, 1988_45) Becker, R., Cross Currents. Jeremy P. Tarcher, Inc., Los Angeles, p. 208, 1990.
- 26 "Serotonin, Suicidal Behaviour, and Impulsivity," The Lancet p. 949-950, 24 Oct. 1987
27. B. Blake Levitt, Electromagnetic Fields: A Consumer's Guide to the Issues and How to Protect Ourselves, Harcourt Brace & Company, 1995
28. Robert Becker, *ibid*
29. Hillman, D., Exposure to Electric and Magnetic Fields (EMR) Linked to Neuro-Endocrine Stress Syndrome: Increased Cardiovascular Disease, Diabetes, & Cancer, Shocking News, No. 8 November 2005
30. Dr. George Carlo, Cell Phones: Invisible Hazards in the Wireless Age
An Insider's Alarming Discoveries About Cancer and Genetic Damage, Carroll & Graf; Reprint edition (February 9, 2002)
31. Script from Dr George Carlo's meeting with Scrutiny Panel
www.jerseymastconcern.co.uk/drcarlotranscript.html
32. Henry Lai and Narendra P. Singh, Magnetic-Field-Induced DNA Strand Breaks in Brain Cells of the Rats, Environmental Health Perspectives Volume 112, Number 6, May 2004.
33. 62nd annual meeting of the American Society for Reproductive Medicine, New Orleans, Oct. 21-25, 2006. Ashok Agarwal, PhD, director, Clinical Andrology Laboratory and Reproductive Tissue Bank; director of research, Reproductive Research Center, The Cleveland Clinic. Rebecca Sokol, MD, PhD, president, Society for Male Reproduction and Urology; professor of medicine and obstetrics and gynecology, Keck School of Medicine, University of Southern California.
34. Mobiles may decrease men's fertility,
www.timesonline.co.uk/tol/news/world/article610494.ece
35. Dr. George Carlo, Cell Phones: Invisible Hazards in the Wireless Age
An Insider's Alarming Discoveries About Cancer and Genetic Damage.
36. Bioenergetics Institute, Energy Resonance Technology (ERT): A Targeted Intervention For Electro-Magnetic Radiation (EMR) Induced Biological Effect.
www.bioenergeticsinstitute.com/Portals/0/Documents/Ungar2006ERTintervEMRbioeffeupdateCorrected.pdf

37. omega.twoday.net/20070223

38. www.safewireless.org

39. Zeng, Qunli; Ke, Zuiqin; Gao, Xiangwei; Fu, Yiti; Lu., Deqiang; Chiang, Huai and Xu, Zhengping 2006. Noise Magnetic Fields Abolish the Gap Junction Intercellular Communication Suppression Induced by 50 Hz Magnetic Fields. Bioelectromagnetics DOI 10.1002/bem20207

40. Smirnov, Igor 2006; Polymer Material Providing Compatibility Between Technologically Originated EMR and Biological Systems. Explore! 14(4):1-7

41. Mullins, J.M., Krause, D. and Litovitz, T.A. 1993 Simultaneous Application Of a Spatially Coherent Noise Field Blocks Response Of Cell Cultures To A 60 Hz Electromagnetic Field Electricity and Magnetism in Biology and Medicine, Catholic University of America.

42. Telephone interview with Dr. George Carlos.