

# Electrosmog – What Price Convenience?

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and Theresa Morrow\*

The public debates over tobacco, x-rays, and asbestos took over 100 years to officially settle public health issues. Today, we are witnessing the same debate over “electrosmog”— an ever-increasing, ubiquitous, invisible form of pollution generated by all-things-wireless and other technologies utilizing non-ionizing radiation.

Though many of the applied technologies are new, the debate is not. Back in 1971, the Electromagnetic Radiation Management Advisory Council to the White House warned that non-ionizing radiation was permeating our environment, that its growth since 1940 had been “phenomenal,” and that there was concern for biological effects, even at low power levels. This was long before Motorola rolled out its consumer cell phone products beginning in 1983. Today over two billion cell phones are in use worldwide. Everything is going wireless, especially personal computer/Internet access. No government agency monitors the rising background levels of electromagnetic radiation (EMR), but the “smog” of it would become obvious if all those waves were suddenly made visible, filling the earth’s surface, atmosphere, and ionosphere, penetrating every living cell — plant, animal, and human.

Non-ionizing radiation fills that section of the electromagnetic spectrum below visible light and includes infrared radiation (lasers, alarm systems, motion detectors), microwaves (cell phones, cordless phones, radar, smoke detectors, MRI, wireless Internet), broadcast applications (TV, FM and AM radio), down to the extremely low frequencies (ELF) of wired appliances and the earth’s natural background. Current safety standards assume this non-ionizing radiation is safe if the power is too weak to heat living tissue. But since the 1980s, a growing body of research has found adverse effects below that thermal threshold — usually referred to as “non-thermal effects” — especially from long-term, low-level exposures. All of today’s popular wireless technologies use the radio frequency (RF) bands,

which include microwaves (MW) and ultra-high-frequency (UHF) wavelengths. A great deal of research has historically been done and continues in some countries — though regrettably no longer in the U.S. — to try to understand the complex picture of how these exposures interact with living tissue.

## Industry Influence

The Telecom Industry quickly became one of the most influential industries in the world, second only to the oil and chemical cartels, and this was no accident. In 1984, after significant pressure, the telecoms were granted blanket exemption from “pre-market testing” of their products as long as they met certain guidelines. That’s analogous to the FDA allowing untested drugs to be marketed without oversight. The telecoms have also managed to make a “partner” of the Federal Communications Commission (FCC). Today, the FCC sees its mandate less as regulatory and more as encouraging the rapid deployment of technology, including protecting the business interests of the companies they once regulated. Lobbyists for the telecom industry actually wrote Section 704 of the Telecom Act of 1996, which forbids municipalities from regulating the placement, construction, or modification of towers or antennas based on the environmental effects of RF if exposures are within FCC guidelines. However, not only are these guidelines among the most lenient in the world, but the FCC’s budget for monitoring has also been slashed, so towers are simply not monitored for compliance. Whole cities are going WiFi. Such systems are categorically excluded from health review.

## No Independent Research

At the same time the Telecom Act of '96 was passed and the FCC monitoring program slashed, the U.S. EPA’s bioelectromagnetics research lab was also defunded. Today there is no research independent of the industry in America. And when the industry does sponsor research today, it’s to shed doubt on studies that have found effects. Industry is on record as wanting to prove the technology is “safe,” not on exploring potential hazard. Most

research now comes from Europe and Asia. Years often pass before new information translates into public health recommendations. All the while technology develops at breakneck speed, far ahead of our understanding of potential effects.

## Bioelectromagnetics:

The emerging picture of electromagnetic fields (EMFs) and the human anatomy is complex and disturbing. Both in the environment and in the body, EMFs can amplify and resonate. They can also cancel each other out or combine with other frequencies, creating a whole different exposure parameter. Magnetite, a mineral highly sensitive to EMFs, has been discovered in human brain



**WHAT THEY DON'T TELL YOU** - The human body is an electromechanical instrument which digital radiation can effect even causing cancers.

tissue as well as in many animals, birds, and fish. All biological processes are likely electrical ones too. Dr. G. J. Hyland of The University of Warwick, U.K., and the International Institute of Biophysics in Neuss-Holzheim, Germany, calls the human body “an electrochemical instrument of exquisite sensitivity,” noting that, like a radio, it can be interfered with by incoming radiation. He explains that modern digital technology pulses microwaves between 2 and 24 times per second. This pulsing is in the frequency range of our brain waves and can cause them to speed up or slow down, changing our level of consciousness, as has been demonstrated in electroencephalograms (EEG). Human brain tissue also reaches

peak absorption in the ultra high frequency bands (UHF) — right where cellular technology functions. Both entrainment phenomena of brain waves and seizures have been observed in people exposed to UHF radiation.

In addition, resting EEG patterns have shown a shortening of REM sleep and a strengthening of alpha waves. In 1996, researchers K. Mann and J. Röschke in Neuropsychobiology, pointed out that “REM sleep plays a special physiological role for information processing in the brain.” Several other studies have demonstrated learning disabilities in test animals exposed to low-level RF/MW, as well as an inability to remember what they have learned. One study in 1996 of children living near a

in diabetics rise and fall with a change of electrical environment.

Of particular significance is the work of Drs. Henry Lai and N.P. Singh (Environmental Health Perspectives, May, 2004) that found both double and single strand DNA breaks, and the work of Drs. Martin Blank and Reba Goodman (Journal of Cellular Biochemistry, 2003) that found significant increases in heat shock proteins with low-level RF exposures. These studies, taken with others, indicate that there is little difference between non-ionizing and ionizing radiation such as that from x-rays. The only factor that counts to living tissue is the exposure duration and/or whether the anatomy has compensating mechanisms sufficient to repair damage before it becomes permanent. Research is beginning to indicate that there may be no safe threshold for these exposures, just like for x-rays. All signs point to the fact that long-term low level exposure to nonionizing radiation is just as detrimental as short-term high intensity exposures to ionizing radiation. And if that’s the case, we are in trouble because non-ionizing radiation is everywhere and growing exponentially.

Sensitivity to RF/MW may accumulate over time, with some people becoming hypersensitive. Called “electromagnetic hypersensitivity syndrome” (EHS), Sweden now estimates that 3% of its population may be so afflicted. Swedes with EHS qualify for disability payments and government help to mitigate their living/work environments. EHS symptoms include headaches, dizziness, fatigue, insomnia, skin rashes and flushing. Onset can be gradual or sudden, such as when a cell tower is erected nearby or a WiFi computer is installed in one’s home or even next door. Sweden now bans cell phone use on certain beaches so that people with EHS can enjoy those areas too.

One European study recommends cell towers be placed no closer than 300 meters (about 1000 feet) from homes. This is based on findings that 18 non-specific health symptoms - fatigue, memory problems, insomnia, headaches, irritability, libido decrease, and so on - decreased with distance from towers (R. Santini, Pathologic Biology, July

continued on page 8

## Electrosmog – What Price Convenience?

continued from page 7

2002). The Connecticut Parents and Teachers Association (PTA) recommends a setback for cell towers and high-tension lines of 1500 feet from schools. But many studies show non-linear effects where the most negative impacts occur in unpredictable “windows” that are not always related to the strongest exposure.

One cancer that’s universally accepted as directly related to cell phone use is acoustic neuroma (cancer of the nerve that connects the ear to brain), but both laboratory and epidemiological studies show a connection to numerous cancers. Associations have been found with cell phones and melanoma of the eye, salivary gland and neck tumors. RF exposures from broadcast facilities have been associated with brain tumors and leukemia. Most significantly, the European Union’s REFLEX Project concluded in 2004 that chronic exposure to low-level EMFs can interfere with the body’s ability to repair broken chromosomes. This leads to the formation of micronuclei, which is how many cancers begin.

And the non-human world is affected too. EMR can cause trees to lose leaves prematurely and become more susceptible to diseases. Evidence shows that RF/MW from cell, TV, and radio towers lowers milk production in cows, causes deformities in amphibians, lowers reproduction in animals and birds, and causes confusion, navigational disruption and death in migratory birds. Bees’ navigational abilities are known to be sensitive to low-level EMFs. The U.S. Fish and Wildlife Service offers a conservative estimate that 4-to-5 million bird deaths per year result from bird collisions with towers. But RF maybe also be acting as an attractant to birds

since their eye, beak and brain tissue is loaded with magnetite, a natural mineral highly sensitive to external magnetic fields that birds use in navigation. Noted American ornithologist, Robert Beason, discovered rapid neuronal firings in avian brain tissue exposed to cell-frequency RFs at very low intensities. There are also indications that RF may be contributing to global warming through the atmospheric agitation of hydrogen molecules in the upper atmosphere and ionosphere.

### Precautionary Principle

The emerging picture is complex, variables are many, research is often hard to replicate, and studies often disagree. But one agreement is that far more research is needed. In the meantime, the reasonable approach is precaution. Lakehead University in Thunder Bay, Canada, recently banned WiFi Internet access from campus because there was not enough proof to show it is safe. The Public Health Commission of Salzburg, Austria, recommends that schools not use wireless networks. The Vienna Doctor’s Chamber of Austria, The British Ministry of Health, and the Danish Health Council have warned against excessive use of mobile phones, especially by children. Their advice includes:

*Headsets are not recommended. The wire can transmit the signal like an antenna.*

*Turn off the mobile phone at night—if left turned on, do not keep it near the head.*

*Play no games on the mobile phone.*

*Avoid carrying the mobile phone in the trousers pocket*

*and sending text messages under the school desk; this can affect fertility.*

*Keep several meters’ distance from people when making a call -- they are irradiated by your cell phone too.*

*Use the Internet via cable connections. Wireless networks lead to high radiation exposure.*

The International Commission for Electromagnetic Safety (ICEMS) met in Benevento, Italy, in February, 2006. Scientists from many nations, including the US, signed a resolution calling for precautionary strategies while research continues. They urge, among other things, that governments promote alternatives to wireless communications systems (like fiberoptics and coaxial cables), and inform the population of potential risks of wireless products. The also recommended wireless-free zones be designated in cities, public buildings and on public transit to allow people who are hypersensitive to EMF access.

The question is - why are Americans so clueless? The discussion in other countries about the environmental effects of nonionizing radiation is far in advance of our own today. Will we wait another 100 years before governments put true safety guidelines in place? Have we learned so little from our past mistakes with DDT, lead paint, tobacco, asbestos, and other forms of radiation that we cannot see electrosmog barreling down on us in electrons at the literal speed of light, carrying billions of human voices in mostly trivial conversations? What is the environmental price of a cell call home for the grocery list, or to say you will be delayed by a few minutes? What price convenience?



**TURN IT OFF:** - European doctors advise keeping a bed side cell phone away from your head and turning it off at night.

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*\*Theresa Morrow, a musician, activist, and co-founder of Citizens Concerned About Wireless Technologies in Egremont, MA, died of breast cancer on May 20, 2007.*

**Special Interest:**  
*www.iaff.org/safe/content/celltower/celltowerfinal.htm for a resolution by the International Association of Firefighters calling for a moratorium on cell tower placement on firehouses. And The Healthy Schools Network filed a friend of the court brief recommending prudent avoidance for cell towers on/near schools.*

See [www.EMRpolicy.org](http://www.EMRpolicy.org).

### To learn more:

**Websites:** The EMR Portal:  
*(for lists of scientific abstracts)*  
[www.emf-portal.de/\\_index.php](http://www.emf-portal.de/_index.php)  
The EMR Policy Institute:  
[www.EMRpolicy.org](http://www.EMRpolicy.org)  
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