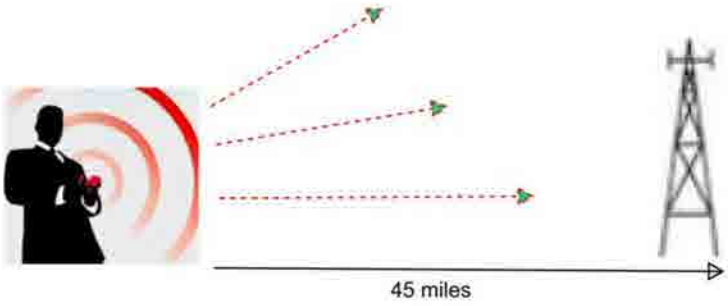
# Information on the biological harm of microwave radiation emitted from wireless devices.

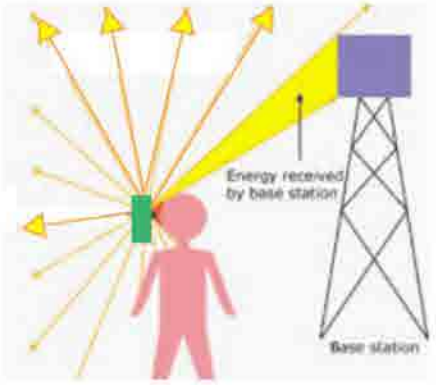
| Article Title | Web page link |
|---|---|
| Effects of the Effect of Ultra High Frequency Mobile Phone Radiation on Human Health. | https://www.ncbi.nlm.nih.gov/pubmed/27382458 |
| Nerve Cell Damage in Mammalian Brain after Exposure to Microwaves from GSM Mobile Phones | https://www.ncbi.nlm.nih.gov/pubmed/12782486 |
| "Brain proteome response following whole body exposure of mice to mobile phone or wireless DECT base radiation", was published in Electromagnetic Biology and Medicine: 1–25, 2012 | https://www.ncbi.nlm.nih.gov/pubmed/22263702 |
| Effect of mobile telephones on sperm quality: A systematic review and meta-analysis ☆ | http://dx.doi.org/10.1016/j.envint.2014.04.015 |
| Effects of the Exposure to Mobile Phones on Male Reproduction: A Review of the Literature | http://www.ncbi.nlm.nih.gov/pubmed/21799142?dopt=Abstract |
| Genotoxic effects of radiofrequency electromagnetic fields | http://www.ncbi.nlm.nih.gov/pubmed/19285841 |
| The effects of radiofrequency electromagnetic radiation on sperm function | https://www.ncbi.nlm.nih.gov/pubmed/27601711 |
| "Opt For Wired" Dr. Martha Herbert, Harvard Pediatric Neurologist Writes MCPS | http://safetechforschoolsmaryland.blogspot.com.au/2015/12/opt-for-wired-dr-martha-herbert-harvard.html |
| The debate is over: Wi-Fi radiation causes serious health problems | http://electromagnetichealth.org/electromagnetic-health-blog/article-by-professor-olle-johansson-health-risk-from-wireless-the-debate-is-over/ |
| EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses | http://www.ncbi.nlm.nih.gov/pubmed/27454111 |
| A Swedish study links mobile phones lined to brain damage | https://www.thecellphonechipstore.com/cell-phones- |
| Neurosurgeon Reveals Radiation from Wi-Fi, Smart Meters and Cell Phones Cause the Blood-Brain Barrier to Leak | https://wakeup-world.com/2016/09/23/neurosurgeon |
| Electromagnetic intolerance elucidated | http://www.emfacts.com/2012/01/electromagnetic-intol |
| Electromagnetic hypersensitivity | http://www.emfwise.com/ehs.php |
| The prevalence of symptoms attributed to electromagnetic field exposure: a cross-sectional representative survey in Switzerland. | http://www.ncbi.nlm.nih.gov/pubmed/17193782 |
| International plea | https://emfscientist.org/index.php/emf-scientist-appeal |
| Lloyds London denies insurance for EMR /mobile phone/wifi | http://www.pemfglobal.com/2015/05/22/worlds-largest-insurance-company-no-longer-covers-electromagnetic-radiation/ |
| The bioinitiative report | http://www.bioinitiative.org/potential-health-effects-emfl |

# PICTORIAL SUMMARY:

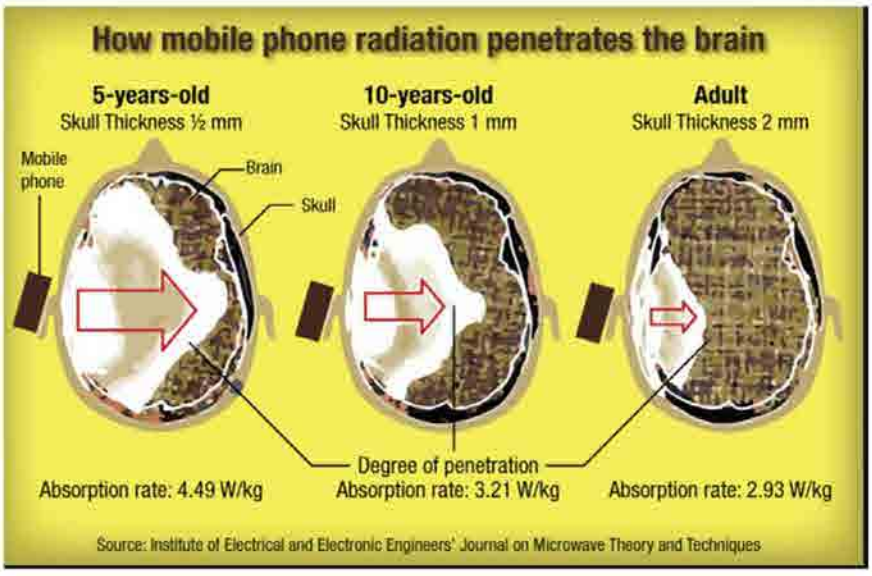
# *ADVERSE BRAIN EFFECTS OF MOBILE PHONES AND WIFI.*



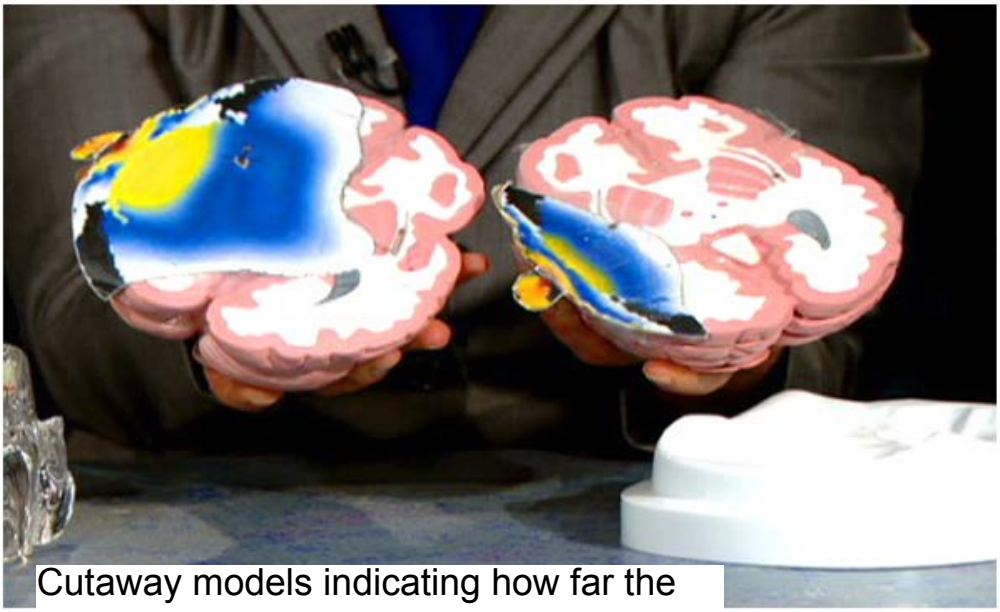

Your mobile phone is a microwave transmitter. A mini tower. It will transmit to a tower up to 45 miles away.




*Unfortunately your head is in the way.*



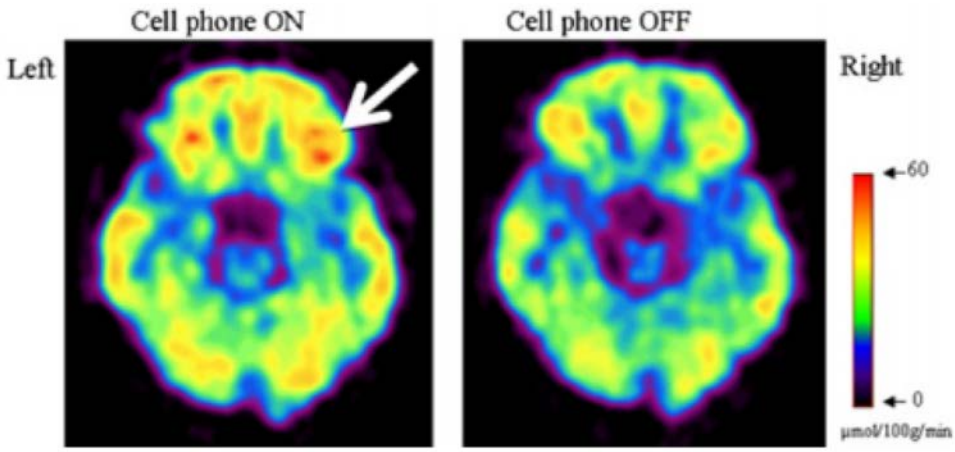

The microwave radiation penetrates your brain.



Cutaway models indicating how far the radiation plume from a mobile phone penetrates the brain.

*Sorry if the last picture was not clear, this might be clearer.*

*But does that impact on the brain?*

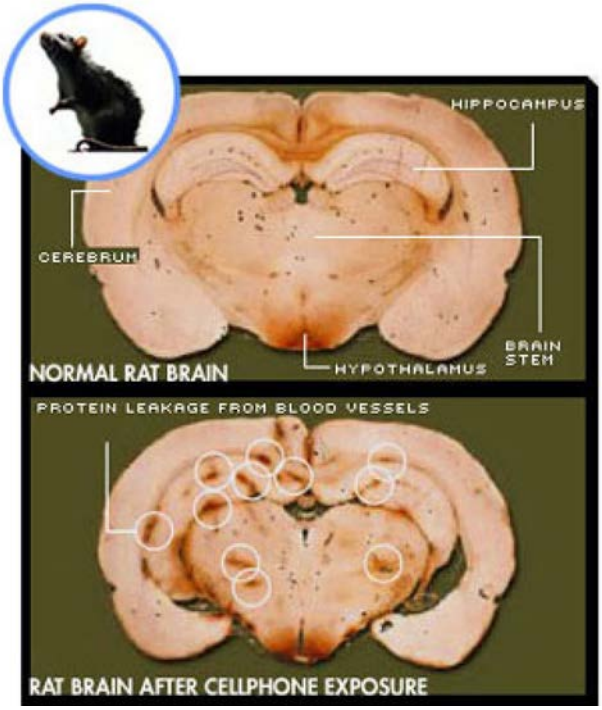



Talking on a cell phone increases the activity in the parts of your brain near the phone's antenna, according to researchers who scanned the brains of a small group of people making phone calls.The study provides perhaps the strongest evidence yet that the weak electromagnetic energy emitted from cell phones can affect the brain

https://www.ncbi.nlm.nih.gov/pubmed/27382458

*But do these changes affect our health?*

*Surely these changes are nothing to worry about.*




All of the brown areas are the areas of damage.

Researchers at Sweden's Lund University say these rat-brain cross-sections show **first-ever evidence of brain damage from cellphone radiation.**

Neurosurgeon Leif Salford and colleagues at Lund University in Sweden published data showing for the first time an unambiguous link between microwave radiation emitted by GSM mobile phones (the most common type worldwide) and brain damage in rats.

Exposure to radiation,including that from cell phones and wi-fi, causes leakage in the blood-brain barrier — the brain's first line of defense against infections and toxic chemicals. Some of the most concerning conclusions result from the fact that even the weakest exposure levels to wireless radiation caused the greatest effect in causing the blood brain barrier to leak.

https://www.ncbi.nlm.nih.gov/pubmed/12782486

*But there is plenty of brain left. So that is not so bad.*

A Greek scientific study has demonstrated important protein changes in the brain of animals following whole body exposure to RF electromagnetic fields, similar to the kind of microwave radiation emitted from cell phones and wireless computer equipment.Widespread changes to the structure of the brain occurred at low levels of radiation.

The study is important because it shows for the first time protein changes in the mouse brain after EMF exposure and in particular in very crucial regions like hippocampus, cerebellum and frontal lobe, all involved in learning, memory and other complicated functions of the mammalian brain. 143 proteins are altered after electromagnetic radiation, including proteins that have been correlated so far with Alzheimer's, glioblastoma, stress and metabolism.

"Brain proteome response following whole body exposure of mice to mobile phone or wireless DECT base radiation", was published in Electromagnetic Biology and Medicine: 1–25, 2012

https://www.ncbi.nlm.nih.gov/pubmed/22263702

*Do we know the mechanism of the brain damage?*

**Damage to the blood brain barrier**

Dr. Leif Salford is a Neurosurgeon at Sweden's Lund University Hospital, and a Professor and Chairman of the Department of Neurosurgery at Lund University. Since 1988 Dr. Salford and his colleagues have conducted many studies on radio frequency radiation and its effects on the brain, exposing over 1,600 experimental animals to 'low-level' radiation. Their results over time have been both consistent and worrisome: Exposure to radiation, including that from cell phones and wi-fi, causes **leakage in the blood-brain barrier** — the brain's first line of defense against infections and toxic chemicals. Some of the most concerning conclusions result from the fact that even the weakest exposure levels to wireless radiation caused the greatest effect in causing the blood brain barrier to leak.

Researchers in 13 other laboratories in 6 different countries had reported the same effect, but no one had proven whether it would lead to any damage in the long term. Then, in a study published June 2003 in Environmental Health Perspectives, Salford's team repeated the experiment on 32 additional animals, but this time waited eight weeks before examining their brains. In those animals that had been exposed to a cell phone, **up to two percent of the neurons in all areas of the brain were shrunken and degenerated.**

*Dr. Salford called the potential implications of this research "terrifying. We have good reason to believe that what happens in rats' brains also happens in humans." Referring to today's children and teenagers, the study's authors wrote that "a whole generation of users may suffer negative effects, perhaps as early as middle age."*

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241519/pdf/ehp0111-000881.pdf

# Are there are other ways that a childs brain may be damaged by mobile phones and wifi?

This can occur due to effects on sperm causing neurodevelopmental effects. There is strong evidence from multiple meta-analysis of sperm damage due to EMF radiation. They are listed below.

| Meta-analysis | Conclusion | Comment |
|---|---|---|
| Effect of mobile telephones on sperm quality: A systematic review and meta-analysis ☆ | "Mobile phone exposure was associated with reduced sperm motility and viability". 2. | Sperm damaged by mobile phones |
| Effects of the Exposure to Mobile Phones on Male Reproduction: A Review of the Literature | Men using mobile phones have decreased sperm concentration, decreased motility (particularly rapid progressive motility), normal morphology, and decreased viability. These abnormalities seem to be directly related to the duration of mobile phone use. | Sperm damaged by mobile phones |
| The effects of radiofrequency electromagnetic radiation on sperm function | In light of this, we envisage a two-step mechanism whereby RF-EMR is able to induce mitochondrial dysfunction | Mechanism of sperm damage is via mitochondrial damage. |
| Genotoxic effects of radiofrequency electromagnetic fields | Taking altogether there is ample evidence that RF-EMF can alter the genetic material of exposed cells in vivo and in vitro and in more than one way. | DNA damage |

http://dx.doi.org/10.1016/j.envint.2014.04.015
http://www.ncbi.nlm.nih.gov/pubmed/21799142?dopt=Abstract
https://www.ncbi.nlm.nih.gov/pubmed/27601711
http://www.ncbi.nlm.nih.gov/pubmed/19285841

Does this suggest that the young generation children are having their sperm damaged by mobile phone radiation?

Ans. Yes. The met-analysis  find that damage occurs from EMF radiation at similar levels to that found in mobile phone use.

# PAEDIATRIC NEUROLOGIST REVIEW

Safe technology IS smart technology. Microwave radiation does not belong in our children's schools!

http://safetechforschoolsmaryland.blogspot.com.au/2015/12/opt-for-wired-dr-martha-herbert-harvard.html

**Monday, December 14, 2015**

# "Opt For Wired" Dr. Martha Herbert, Harvard Pediatric Neurologist Writes MCPS

*"I urge you to opt for wired technologies in Montgomery County classrooms, particularly for those subpopulations that are most sensitive. It will be easier for you to make a healthier decision now than to undo misguided decisions later."*

Dear Montgomery County School District,

I am a pediatric neurologist and neuroscientist on the faculty of Harvard Medical School and on staff at the Massachusetts General Hospital. I am Board Certified in Neurology with Special Competency in Child Neurology, and Subspecialty Certification in Neurodevelopmental Disorders. I have an extensive history of research and clinical practice in neurodevelopmental disorders, particularly autism spectrum disorders. I have published papers in brain imaging research, in physiological abnormalities in autism spectrum disorders, and in environmental influences on neurodevelopmental disorders such as autism and on brain development and function.

A few years ago I accepted an invitation to review literature pertinent to a potential link between Autism Spectrum Disorders and Electromagnetic Frequencies (EMF) and Radiofrequency Radiation(RFR). I set out to write a paper of modest length, but found much more literature than I had anticipated to review. I ended up producing a 60 page single spaced paper with over 550 citations. It is available at http://www.bioinitiative.org/report/wpcontent/uploads/pdfs/sec20_2012_Findings_in_Autism.pdf and it was published in a revised and somewhat shortened form in two parts in the peer reviewed indexed journal Pathophysiology (2013)with the title: Áutism and EMF? Plausibility of a pathophysiological link." Please also see the appendix to this letter which contains a summary of this material and includes substantial scientific citations.

More recently I published an article entitled "Connections in Our Environment: Sizing upElectromagnetic Fields," in Autism Notebook Spring 2015 edition in which I summarized and personalized the information in the . In this article I describe how here is a whole series of problems at the cellular, sub-cellular and metabolic levels and immune levels that have been identified in autism. And interestingly, for every single one of those problems, there's literature about how EMFs can create those kinds of problems.

The argument I made in these articles is not that EMF is proven to cause autism, but rather, that EMF can certainly contribute to degrading the physiological integrity of the system at the cellular and molecular level" – and this in turn appears to contribute to the pathogenesis/causation not only of autism but of many highly common chronic illnesses, including cancer, obesity, diabetes and heart disease.. Please see this article on page 24-25 at the link http://virtualpublications.soloprinting.com/publication/?i=252361

In fact, there are thousands of papers that have accumulated over decades –and are now accumulating at an accelerating pace, as our ability to measure impacts become more sensitive – that document adverse health and neurological impacts of EMF/RFR. Children are more vulnerable than adults, and children with chronic illnesses and/or neurodevelopmental disabilities are even more vulnerable. Elderly or chronically ill adults are more vulnerable than healthy adults.

Current technologies were designed and promulgated without taking account of biological impacts other than thermal impacts. We now know that there are a large array of impacts that have nothing to do with the heating of tissue. The claim from wifi proponents that the only concern is thermal impacts is now definitively outdated scientifically.

Radiofrequency electromagnetic radiation from wifi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function. This will make it harder for some children to learn, particularly those who are already having learning or medical problems in the first place. And since half of the children in this country have some kind of chronic illness, this means that a lot of people are more vulnerable than you might expect to these issues.

Powerful industrial entities have a vested interest in leading the public to believe that EMF/RFR, which we cannot see, taste or touch, is harmless, but this is not true. Please do the right and precautionary thing for our children.

I urge you to opt for wired technologies in Montgomery County classrooms, particularly for those subpopulations that are most sensitive. It will be easier for you to make a healthier decision now than to undo misguided decisions later.

Thank you.

Martha Herbert, PhD, MD

APPENDIX: MORE DETAILED SUMMARY OF THE PATHOPHYSIOLOGY

I became interested in the health and brain effects of electromagnetic frequency (EMF) and radiofrequency radiation (RFR) exposures in relation to my brain research because I was interested in how such exposures might alter brain function. In order to familiarize myself in more detail existing literature on the pathophysiological impacts of EMF/RFR, I coauthored a 40,000 word chapter in the 2012 update of the Bioinitiative, 1 and published an updated 30,000 word version of that paper ("Autism and EMF? Plausibility of a Pathophysiological Link") in 2013 in two parts in the peer reviewed journal Pathophysiology. 2, 3 My intention was to assess the plausibility of an association between increasing incidence of autism spectrum disorder and increasing EMF/RFR exposures.

Rather than directly address the epidemiological issues, I looked at the parallels between the

pathophysiological features documented in autism and the pathophysiological impacts of EMF/RFR documented in the peer-reviewed published scientific literature. I will include here a brief summary of the paper (prepared for a lay audience) of the features of EMF/RFR that I reviewed (with citations at the end of this letter):

- EMF/RFR stresses cells. It lead to cellular stress, such as production of heat shock proteins, even when The EMF/RFR isn't intense enough to cause measurable heat increase. 4-6
- EMF/RFR damages cell membranes, and make them leaky, which makes it hard for them to maintain important chemical and electrical differences between what is inside and outside the membrane. This degrades metabolism in many ways – makes it inefficient. 7-15
- EMF/RFR damages mitochondria. Mitochondria are the energy factories of our cells. Mitochondria conduct their chemical reactions on their membranes. When those membranes get damaged, the mitochondria struggle to do their work and don't do it so well. Mitochondria can also be damaged through direct hits to steps in their chemical assembly line. When mitochondria get inefficient, so do we. This can hit our brains especially hard, since electrical communication and synapses in the brain demands huge amounts of energy.
- EMF/RFR creates "oxidative stress." Oxidative stress is something that occurs when the system can't keep up with the stress caused by utilizing oxygen, because the price we pay for using oxygen is that it generates free radicals. These are generated in the normal course of events, and they are "quenched" by antioxidants like we get Treatment Research And NeuroSCience Evaluation of NeuroDevelopmental Disorders in fresh fruits and vegetables; but when the antioxidants can't keep up or the damage is too great, the free radicals start damaging things.
- EMF/RFR is genotoxic and damages proteins, with a major mechanism being EMF/RFR-created free radicals which damage cell membranes, DNA, proteins, anything they touch. When free radicals damage DNA they can cause mutations. This is one of the main ways that EMF/RFR is genotoxic – toxic to the genes. When they damage proteins they can cause them to fold up in peculiar ways. We are learning that diseases like Alzheimer's are related to the accumulation of mis-folded proteins, and the failure of the brain to clear out this biological trash from its tissues and fluids.
- EMF/RFR depletes glutathione, which is the body's premier antioxidant and detoxification substance. So on the one hand EMF/RFR creates damage that increases the need for antioxidants, and on the other hand they deplete those very antioxidants.1, 16
- EMF/RFR damages vital barriers in the body, particularly the blood-brain barrier, which protects the brain from things in the blood that might hurt the brain. When the blood-brain barrier gets leaky, cells inside the brain suffer, be damaged, and get killed. 1, 16, 17
- EMF/RFR can alter the function of calcium channels, which are openings in the cell membranes that play a huge number of vital roles in brain and body. 18-27
- EMF/RFR degrades the rich, complex integration of brainwaves, and increase the "entropy" or disorganization of signals in the brain – this means that they can become less synchronized or coordinated; such reduced brain coordination has been measured in autism. 28-40
- EMF/RFR can interfere with sleep and the brain's production of melatonin. 41-43
- EMF/RFR can contribute to immune problems. 44-50
- EMF/RFR contribute to increasing stress at the chemical, immune and electrical levels, which we experience psychologically. 51-57 17, 58-62 63-68

Please note that:

1. There are a lot of other things that can create similar damaging effects, such as thousands of “xenobiotic” substances that we call toxicants. Significantly, toxic chemicals (including those that contain naturally occurring toxic elements such as lead and mercury) cause damage through many of the same mechanisms outlined above.
2. In many of the experimental studies with EMF/RFR, damage could be diminished by improving nutrient status, particularly by adding antioxidants and melatonin. 69-72

I understand that the concept of electromagnetic hypersensitivity is not always well understood in the medical and scientific communities. Indeed, the inter-individual variability is perplexing to those who would expect a more consistent set of features.

But given the range of challenges I have listed that EMF/RFR poses to core processes in biological systems, and given the inter-individually variable vulnerability across these symptoms, it is really not surprising that there would be subgroups with different combinations of symptom clusters.

It also appears to be the case that the onset and duration of symptoms or even brain response to EMR/RFR can be variable. This again is to be expected given the mediation of these symptoms through a variety of the above-listed pathophysiological processes, many of which differ in scale (ranging from molecular to cellular to tissue and organ) and time course of impact. The different parts of the body also absorb this energy differently, both Treatment Research And NeuroSCience Evaluation of NeuroDevelopmental Disorders because of their biophysical properties and as a function of their state of health or compromise thereof.

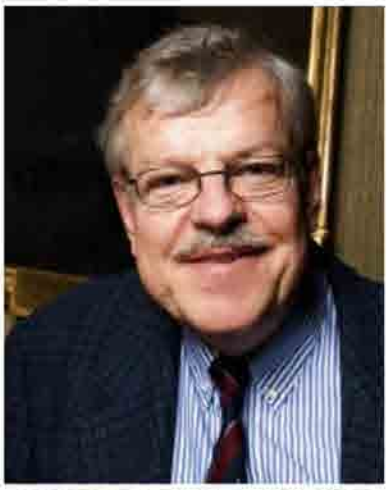
Here is a list of subgroups of symptom clusters identified by a group of German physicians, t exemplifies these variability issues:

- Group 1 no symptoms
- Group 2 sleep disturbance, tiredness, depressive mood
- Group 3 headaches, restlessness, dazed state, irritability, disturbance of concentration, forgetfulness, learning difficulties, difficulty finding words
- Group 4 frequent infections, sinusitis, lymph node swellings, joint and limb pains, nerve and soft tissue pains, numbness or tingling, allergies
- Group 5 tinnitus, hearing loss, sudden hearing loss, giddiness, impaired balance, visual disturbances, eye inflammation, dry eyes Group
- 6 tachycardia, episodic hypertension, collapse
- Group 7 other symptoms: hormonal disturbances, thyroid disease, night sweats, frequent urge to urinate, weight increase, nausea, loss of appetite, nose bleeds, skin complaints, tumors, diabetes

Full Citations are in the Full Letter Here.

Watch Dr. Herbert Lecture at Autism Canada Conference Here

# Some facts



**Associate Prof. Olle Johansson**
The Experimental Dermatology Unit
Department of Neuroscience
Karolinska Institute, Stockholm,

# The debate is over: Wi-Fi radiation causes serious health problems

According to Associate Professor Olle Johansson from the Department of Neuroscience at the Karolinska Institute in Stockholm "the debate is over". He says, "the spectrum of possible health problems arising is extraordinarily wide – from brain tumors and leukemia to exhaustion, decreased memory and concentration and just feeling uncomfortable."

Professor Johansson goes on to say, "The allowed radiation limits throughout the world are insane, to say the least. We are talking about values up to 1,000,000,000,000,000,000 (10 to the 18th) times higher than nature's background radiation, to which the human body has adapted through many 100,000 of years, and within a couple of decades, we have all been surrounded by biblical levels of artificial radio-waves, well knowing that they have major impacts on both human and animal health."

# Schools around the world are waking up to the dangers of Wi-Fi

Princeton University recently removed its position statement on wireless safety from their website after parents raised concerns that Princeton's information was "outdated and inaccurate." Earlier, this year, France banned Wi-Fi in nursery schools. In addition, schools in Germany, Austria, Israel and Australia have pulled the plug on Wi-Fi altogether.

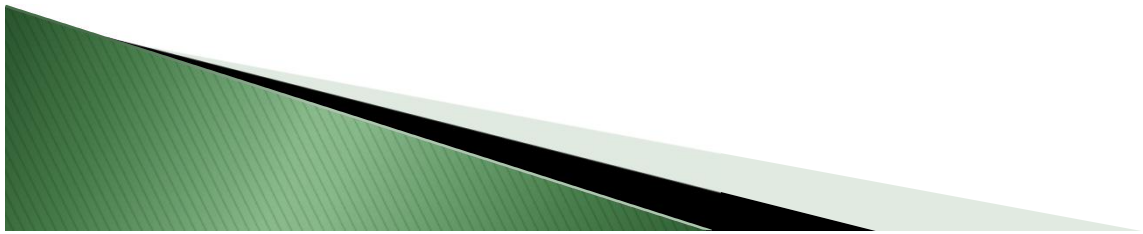
http://electromagnetichealth.org/electromagnetic-health-blog/article-by-professor-olle-johansson-health-risk-from-wireless-the-debate-is-over/

# Myth

*"Scientific research does not demonstrate health risks from low level radiation exposure".*

**The Truth:** Over 5000 scientific papers demonstrate biological harm

1800 NEW studies in the Bioinitiative Report show harm at levels thousands of times below Health Canada Guidelines



# What does the science say?

- Blood brain barrier Permeability
- Irreversible Infertility
- Reduced sperm motility in males
- Heart Palpitations
- DNA damage
- Increase in Cancer Risk
- Melatonin reduction
- Sleep disorders
- Neurodegenerative diseases
- Salivary gland tumours
- Tinnitus and ear damage
- Electro hypersensitivity
- Effects on skin, eyes

*SPIN:* ***Service-providers claim that Wi-Fi/cell phone/Smart meter radiation is safe, and the media haven't reported anything conclusive, so there's no need to worry.***

**FACT: Thousands of scientific studies attest to the damage caused by RF and other forms of radiation.**

• The results of many of these studies have been published in reputable medical and scientific journals such as *The Lancet, the International Journal of Neuroscience, the Journal of Applied Sciences Research, Electromagnetic Biology and Medicine* and *NeuroToxicology*, among others (http://nutritionalbalancing.org/center/environment/articles/emf-emr-health-effects#ref).

• Studies find adverse biological effects from Wi-Fi frequencies (2.4 or 5GHz), with exposures of <16V/m (such as those from a Wi-Fi-enabled device): http://bit.ly/1jsIPUp.

• **A $25m study by the National Toxicology Program of the NIH found that cell phone radio frequency radiation caused two types of tumours: glioma and schwannoma (acoustic neuromas).**[10]

• "EMFs provoke major effects in the brain," says oncologist Dr Dominique Belpomme. "The most important of these is the opening of the blood–brain barrier. This allows mercury, organochlorines and other pollutants to enter the brain, where they cause various neurodegenerative diseases."[11]

• While some reports in the media strive to prove that EMR doesn't harm us, doctors and specialists around the world are quietly helping those whose lives have been torn apart by the very real and devastating phenomenon of electromagnetic hypersensitivity. For a timeline of growing awareness of/landmark rulings re EHS, see: http://www.emfwise.com/awareness.php.

• Associate Professor Dr Olle Johansson, a neuroscientist at the Karolinska Institute in Sweden who has been researching the biological effects of RF wireless radiation for more than 30 years, predicts a "paradigm shift" in attitudes towards EMF. Our environment currently has about 10 billion times more RF radiation than it did in the 60s. "If this environment is safe," Johansson says, "we're talking about **15,000–25,000 papers—in peer-reviewed scientific journals**—all being wrong. That has never happened before."

10 www.saferemr.com/2016/05/national-toxicology-program-finds-cell.html
11 See: http://goo.gl/RCiYLa

# SCIENTIFIC

# REVIEW ARTICLE

A scientific review of all the data concludes that the EMR or microwave radiation may lead to Alzheimer's, cancer and infertility.

**Format**: Abstract

Rev Environ Health. 2016 Jul 25. pii: /j/reveh.ahead-of-print/reveh-2016-0011/reveh-2016-0011.xml 10.1515/reveh-2016-0011. [Epub ahead of print]

# EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses.

Belyaev I, Dean A, Eger H, Hubmann G, Jandrisovits R, Kern M, Kundi M, Moshammer H, Lercher P, Müller K, Oberfeld G, Ohnsorge P, Pelzmann P, Scheingraber C, Thill R.

## Abstract

Chronic diseases and illnesses associated with non-specific symptoms are on the rise. In addition to chronic stress in social and work environments, physical and chemical exposures at home, at work, and during leisure activities are causal or contributing environmental stressors that deserve attention by the general practitioner as well as by all other members of the health care community. It seems necessary now to take "new exposures" like electromagnetic fields (EMF) into account. Physicians are increasingly confronted with health problems from unidentified causes. Studies, empirical observations, and patient reports clearly indicate interactions between EMF exposure and health problems. Individual susceptibility and environmental factors are frequently neglected. New wireless technologies and applications have been introduced without any certainty about their health effects, raising new challenges for medicine and society. For instance, the issue of so-called non-thermal effects and potential long-term effects of low-dose exposure were scarcely investigated prior to the introduction of these technologies. Common electromagnetic field or EMF sources: Radio-frequency radiation (RF) (3 MHz to 300 GHz) is emitted from radio and TV broadcast antennas, Wi-Fi access points, routers, and clients (e.g. smartphones, tablets), cordless and mobile phones including their base stations, and Bluetooth devices. Extremely low frequency electric (ELF EF) and magnetic fields (ELF MF) (3 Hz to 3 kHz) are emitted from electrical wiring, lamps, and appliances. Very low frequency electric (VLF EF) and magnetic fields (VLF MF) (3 kHz to 3 MHz) are emitted, due to harmonic voltage and current distortions, from electrical wiring, lamps (e.g. compact fluorescent lamps), and electronic devices. On the one hand, there is strong evidence that long-term exposure to certain EMFs is a risk factor for diseases such as certain cancers, Alzheimer's disease, and male infertility. On the other hand, the emerging electromagnetic hypersensitivity (EHS) is more and more recognized by health authorities, disability administrators and case workers, politicians, as well as courts of law. We recommend treating EHS clinically as part of the group of chronic multisystem illnesses (CMI), but still recognizing that the underlying cause remains the environment. In the beginning, EHS symptoms occur only occasionally, but over time they may increase in frequency and severity. Common EHS symptoms include headaches, concentration difficulties, sleep problems, depression, a lack of energy, fatigue, and flu-like symptoms. A comprehensive medical history, which should include all symptoms and their occurrences in spatial and temporal terms and in the context of EMF exposures, is the key to making the diagnosis. The EMF exposure is usually assessed by EMF

measurements at home and at work. Certain types of EMF exposure can be assessed by asking about common EMF sources. It is very important to take the individual susceptibility into account. The primary method of treatment should mainly focus on the prevention or reduction of EMF exposure, that is, reducing or eliminating all sources of high EMF exposure at home and at the workplace. The reduction of EMF exposure should also be extended to public spaces such as schools, hospitals, public transport, and libraries to enable persons with EHS an unhindered use (accessibility measure). If a detrimental EMF exposure is reduced sufficiently, the body has a chance to recover and EHS symptoms will be reduced or even disappear. Many examples have shown that such measures can prove effective. To increase the effectiveness of the treatment, the broad range of other environmental factors that contribute to the total body burden should also be addressed. Anything that supports homeostasis will increase a person's resilience against disease and thus against the adverse effects of EMF exposure. There is increasing evidence that EMF exposure has a major impact on the oxidative and nitrosative regulation capacity in affected individuals. This concept also may explain why the level of susceptibility to EMF can change and why the range of symptoms reported in the context of EMF exposures is so large. Based on our current understanding, a treatment approach that minimizes the adverse effects of peroxynitrite - as has been increasingly used in the treatment of multisystem illnesses - works best. This EMF Guideline gives an overview of the current knowledge regarding EMF-related health risks and provides recommendations for the diagnosis, treatment and accessibility measures of EHS to improve and restore individual health outcomes as well as for the development of strategies for prevention.

PMID: 27454111 DOI: 10.1515/reveh-2016-0011

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# EVIDENCE OF BRAIN DAMAGE

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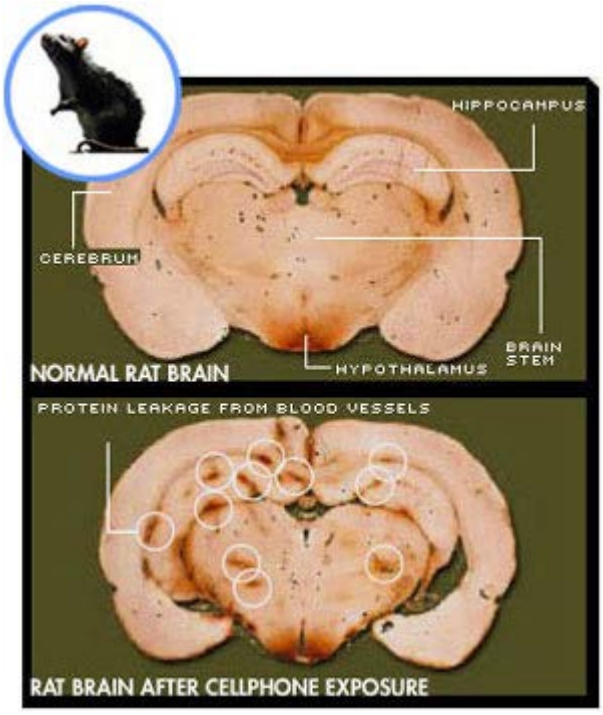
# A Swedish study links mobile phones to brain damage.

*The Cell Phone Chip Store*

A Swedish study links mobile phones to brain damage.

Popular Science Magazine, February 2004

Researchers at Sweden's Lund University say these rat-brain cross-sections show first-ever evidence of brain damage from cellphone radiation.




While the controls (example, top) appear healthy, the test subjects (bottom), which were exposed to a 2-hour dose of cellphone radiation of varying intensities, are heavily spotted with proteins (dark patches) leaked from surrounding blood vessels, and show signs of significant neuronal damage.

For complete article, see below

Neuroscience: A Swedish study links mobile phones
to brain damage. In rats, anyway.
by Elizabeth Svoboda
February 2004

The safety of cellphones has been called into question, again. This time the scientific community is paying very close attention.

Last summer neurosurgeon Leif Salford and colleagues at Lund University in Sweden published data showing for the first time an unambiguous link between microwave radiation emitted by GSM mobile phones (the most common type worldwide) and brain damage in rats. If Salford's results are confirmed by follow-up studies in the works at research facilities worldwide, including one run by the U.S. Air Force, the data could have serious implications for the one billion? plus people glued to their cellphones.

The findings have re-ignited a longstanding debate among scientists and cellphone manufacturers over cellphone safety.

Many of the hundreds of studies performed during the past decade suggest cellphone use may cause a host of adverse effects, including headaches and memory loss. Other studies, however, have shown no such effects, and no scientific consensus exists about the effect of long-term, low-level radiation on the brain and other organs.

A comprehensive $12 million federal investigation of cellphone safety is currently under way but will take at least five years to complete.

Meanwhile, the research world is scrambling to replicate Salford's surprising results. His team exposed 32 rats to 2 hours of microwave radiation from GSM cellphones.

Researchers attached the phones to the sides of the rats' small cages using coaxial cables -- allowing for intermittent direct exposure -- and varied the intensity of radiation in each treatment group to reflect the range of exposures a human cellphone user might experience over the same time period. Fifty days after the 2-hour exposure, the rat brains showed significant blood vessel leakage, as well as areas of shrunken, damaged neurons. The higher the radiation exposure level, the more damage was apparent. The controls, by contrast, showed little to no damage. If human brains are similarly affected, Salford says, the damage could produce measurable, long-term mental deficits.

The cellphone industry so far has been quick to dismiss the data, saying emissions from

current mobiles fall well within the range of radiation levels the FCC deems safe (body-tissue absorption rates of under 1.6 watts per kilogram). "Expert reviews of studies done over the past 30 years have found no reason to believe that there are any health hazards whatsoever," says Mays Swicord, scientific director of Motorola's Electromagnetic Energy Programs. Dr. Marvin Ziskin, chair of the Institute of Electrical and Electronics Engineers' Committee on Man and Radiation, is similarly skeptical. "The levels of radiation they used seem way too low to be producing the kinds of effects they're claiming."

Salford is the first to admit that it's too early to draw any conclusions, but contends the unusual results deserve a closer look. "The cellphone is a marvelous invention; it has probably saved thousands of lives," he says. "But governments and suppliers should be supporting more autonomous research." Meanwhile, Salford advises users to invest in hands-free headsets to reduce radiation exposure to the brain.

# Neurosurgeon Reveals Radiation from Wi-Fi, Smart Meters and Cell Phones Cause the Blood-Brain Barrier to Leak


By Marco Torres

Dr. Leif Salford is a Neurosurgeon at Sweden's Lund University Hospital, and a Professor and Chairman of the Department of Neurosurgery at Lund University. Since 1988 Dr. Salford and his colleagues have conducted many studies on radio frequency radiation and its effects on the brain, exposing over 1,600 experimental animals to 'low-level' radiation.

Their results over time have been both consistent and worrisome: Exposure to radiation, including that from cell phones and wi-fi, causes leakage in the blood-brain barrier — the brain's first line of defense against infections and toxic chemicals. Some of the most concerning conclusions result from the fact that even the weakest exposure levels to wireless radiation caused the greatest effect in causing the blood brain barrier to leak.

Researchers in 13 other laboratories in 6 different countries had reported the same effect, but no one had proven whether it would lead to any damage in the long term. Then, in a study published June 2003 in Environmental Health Perspectives, Salford's team repeated the experiment on 32 additional animals, but this time waited eight weeks before examining their brains. In those animals that had been exposed to a cell phone, up to two percent of the neurons in all areas of the brain were shrunken and degenerated.

Dr. Salford called the potential implications of this research "terrifying. We have good reason to believe that what happens in rats' brains also happens in humans." Referring to today's children and teenagers, the study's authors wrote that "a whole generation of users may suffer negative effects, perhaps as early as middle age."

An argument is sometimes posed to those who express concern about radiation from "smart" meters, Wi Fi etc., that the radiation emitted from these devices is at such low levels that the public needn't worry about it. However this is not necessarily accurately. Dr. Salford's studies showed opening up of the blood brain barrier from even very low levels of radiation exposure. In fact, Cindy Sage and Dr. David Carpenter explained in a 2008 paper published in the peer-reviewed journal *Pathophysiology*, entitled Public Health Implications of Wireless Technologies, that it is actually *"the weakest exposure level [which] showed the greatest effect in opening up the BBB [blood brain barrier]."*

In a PBS interview with Dr. Keith Black, chairman of neurosurgery and director of the Maxine Dunitz Neurosurgical Institute at Cedars-Sinai Medical Center in Los Angeles, commented on the WHO's classification of RF Electromagnetic radiation as a 2B possible carcinogen.

> "We haven't had any good studies in the pediatric population. A child's skull is much thinner... and the amount of radiation that goes into the pediatric brain is much higher than in an adult. So we should be cautious with how we allow our children to use a cell phone. They're going to be the ones that not only use [this technology] at a much younger age but at a much longer duration [than older generations]."

Let's start connecting the dots and end this madness to our health, and the health of future generations.

**About the author:**

Marco Torres is a research specialist, writer and consumer advocate for healthy lifestyles. He holds degrees in Public Health and Environmental Science, and is a professional speaker on topics such as disease prevention, environmental toxins and health policy.

# French researchers recently demonstrated that electromagnetic fields (EMFs) substantially alter the physiology of the blood and brain

## Electromagnetic intolerance elucidated


By André Fauteux, Editor

(Translated from La Maison du 21e siècle magazine, Quebec (Canada), January 2011)

In 2002, World Health Organization (WHO) Director General Gro Harlem Brundtland told journalists that microwaves emitted by cellphones made her sick, even if the phone only turned on and hidden in a pocket or purse located up to four meters away. Nonetheless, the World Health Organization stated in 2005 that electrosensitivity symptoms may be of psychosomatic origin, a claim French oncologist Dominique Belpomme says is refuted recent discoveries.

French researchers recently demonstrated that electromagnetic fields (EMFs) substantially alter the physiology of the blood and brain of electrosensitive people and that the impact on these biological markers increases and decreases according to the intensity of EMF exposure.

“We know with certainty that electromagnetic hypersensitivity is not psychosomatic”, Dr Dominique Belpomme stated in a [November 2010] telephone interview. “EMFs provoke major effects in the brain. The most important of these is the opening of the blood-brain barrier. This allows mercury, organochlorines and other pollutants to enter in the brain, where they cause various neurodegenerative diseases. ”

### 20 new patients per week

A professor of oncology at Paris-Descartes University, Dr. Belpomme is President of the French Association for Research in Therapeutics Against Cancer (www.artac.info), which has shifted in the prevention from 2004. Since May 2008, his team has studied what he coined the Electromagnetic Intolerance Syndrome (SICEM in French). “I have 450 patients and see up to 20 new cases every week, including children who have headaches, impaired memory, concentration or language. We have the largest European cohort of electrosensitive patients. This is a major public health concern.”

The SICEM is an extreme reaction to low-level exposure to 50/60 Hz electric and magnetic fields emitted by electrical cables and devices as well as radio frequencies (10 MHz to 300 GHz including microwave) from wireless devices and antennas.

”In Sweden, electrohypersensitivity (EHS) is an officially fully recognized functional impairment (i.e., it is not regarded as a disease, thus no diagnosis exists), explains Swedish dermatologist and EHS expert Olle Johannson. Thus, the first step for a person in Sweden with a functional impairment is to contact the municipality’s special civil servant for disability issues, as well as the various handicap organizations and authorities, to achieve accessibility measures of various types with the sole aim to have an equal life in a society based on equality according to the The UN Convention on Human Rights for Persons with Functional Impairments, www.un.org.”

People with EHS are often incorrectly referred in psychiatry while many experts such as Belpomme say the first treatment they require is reducing or eliminating their exposure to EMFS. Their symptoms (neurological, cardiovascular, dermatological, muscular, etc.) are sometimes so serious that they must shield themselves with special clothing, curtains as well as grounded paints and vapor barriers. Others move into forests, caves or other remote locations if they are unable to find a low-EMF environment where their symptoms can recede or disappear.

Dr. Belpomme’s team has developed a diagnostic method based on blood tests and a special brain scan (pulsed Doppler echography) to visualize blood flow. “These patients clearly have vascular disorders in the brain, said the oncologist. In addition, our biological tests show that 30% of them

have high levels of histamine, 50% have too much stress proteins, most have low levels of melatonin (an potent anti-cancer hormone), and 30% have levels of antibodies and proteins that are tell-tale signs of thermal shock and brain damage." He adds that half of his patients suffer from Multiple Chemical Sensitivity (MCS) and that MCS and EHS share the same brain abnormalities.

The oncologist explained that there are three distinct levels of sensitivity to pollutants. First, there is intolerance, caused by polymorphism. "This means that we are all different. For example, 30% of the population is most at risk of developing cancer."

Second, there is the susceptibility factor demonstrated by Swedish oncologist Lennart Hardell who studied 16 families who were electrosensitive because of shared genetic factors. There are also active susceptibility factors, "such as dental amalgam that behave like antennas capturing airwaves", explains Belpomme.

Finally, electromagnetic hypersensitivity appears in two stages. "The first phase is induced by exposure to a specific EMF frequency, either an acute or chronic exposure, such as talking on a cell phone 20 minutes every day. The first signs of hypersensitivity are pain and a heat sensation in the ear. In the second phase, the disease sets in. That's when you become intolerant at all frequencies."

## Experienced researchers

ARTAC's scientific council is chaired by virologist Luc Montagnier, 2008 co-recipient of the Nobel Prize in medicine as co-discoverer of the Human Immunodeficiency Virus (HIV) believed to cause AIDS. And its research coordinator is doctor of nutrition Philippe Irigaray, one of five international experts recently appointed by Quebec's Health Research Fund to select the most promising research projects in environmental cancer prevention. Dr Irigaray stresses that the human brain contains magnetosomes, iron oxides that behave like magnets. Electrosensitivity may depend on their quantity, which varies from one individual to another.

ARTAC researchers are currently preparing five scientific papers on electrosensitivity. "It takes a lot of time, said Dr Belpomme. They will published in a year or two. But action is needed immediately to reduce people's overexposure to EMFs."

In France, an estimated 5% of the population is already electrosensitive, and the proportion is constantly increasing with the ever-growing popularity of wireless technologies. "Studies show that 10 to 50% of the population may become very intolerant to EMFs over the next 25 to 50 years, Dr Belpomme said. I have two cases of multiple sclerosis triggered after prolonged use of a cell phone, three cases of breast cancer – two recurrences after exposure to EMFs and one case related to the use of computers – and anecdotal evidence also for autism and Alzheimer's disease whose risk is much higher than for cancer. Causal links with electromagnetic fields are highly possible."

Dr Belpomme said he has relieved some EHS patients by administering medication to tone-up the nervous system and antihistamines to close the blood-brain barrier.

## No causal link, says WHO

In 2005, the World Health Organization published Fact Sheet No 296 entitled Electromagnetic hypersensitivity. It stated : "Well controlled and conducted double-blind studies have shown that symptoms were not correlated with EMF exposure... The symptoms are certainly real and can vary widely in their severity... Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem.
Physicians: Treatment of affected individuals should focus on the health symptoms and the clinical picture, and not on the person's perceived need for reducing or eliminating EMF in the workplace or home. This requires:
• a medical evaluation to identify and treat any specific conditions that may be responsible for the symptoms,
• a psychological evaluation to identify alternative psychiatric/psychological conditions that may be responsible for the symptoms,

• an assessment of the workplace and home for factors that might contribute to the presented symptoms. These could include indoor air pollution, excessive noise, poor lighting (flickering light) or ergonomic factors. A reduction of stress and other improvements in the work situation might be appropriate."

Bull, said Dr. Dominique Belpomme. "This setback is of a political nature that has nothing to do with science. WHO will be forced to revise its decision in the coming months. It is a societal denial that does not take account of current knowledge which is constantly evolving. " [read Microwave News's coverage of conflicts of interest at WHO]

The oncologist argues the causal link between exposure to magnetic fields and leukemia is no longer in doubt. "When we increase the dose, it increases the rate of leukemia. Dozens of laboratory toxicological studies have demonstrated this most clearly, in vitro as well as in animals."

For her part, Ontario researcher Magda Havas of Trent University said EHS studies with negative results have major biases. "The researchers assumed that reactions to EMFs are immediate, while there is often a delay between exposure and response. People are not switches that can be turned on and off. These studies incorrectly insinuate that if you can not feel anything, it can't harm you. We know very well that we can't detect the taste of arsenic, lead, DDT nor asbestos, but they are all toxic."

https://www.emfacts.com/2012/01/electromagnetic-intolerance-elucidated/

# HARM TO THE FETUS

# Many warnings - unborn babies & children

## American Academy of Environmental Medicine, April 2012

- Children at particular risk – "altered brain development, and impaired learning and behaviour"

## Journal of Neuroscience Research, August 2009

- Studies show clear and serious detrimental effects on brains of unborn babies

## Pediatric and Adolescent Medicine, August 2011

- 626 Children followed for 13 years –EMF exposure in pregnancy may increase risk of asthma

# Environment & Human Health, Inc.
# February 2012

- Significant health risks to children & pregnant women
- Human brain especially susceptible to irreversible damage
- Nervous systems changes include diminished learning and reaction time, decreased motor function, reduced memory accuracy, hyperactivity and diminished cognition

- Lead Author:

John Wargo, PhD, Professor of Environmental Risk and Policy at Yale

safesleevecases.com

# Israeli Study Shows Cell Phone Use Greatly Reduces Male Fertility

http://dx.doi.org/10.1016/j.rbmo.2015.06.006

*SafeSleeve Anti-Radiation Cases*

*Image source: Jerusalem Post*

> *"Men using a cellular phone for more than one hour a day double the risk of their sperm count dropping to levels too low for procreation, according researchers from the Haifa Technion and the Carmel Medical Center."*

## Summary

- Male partners are the cause of infertility in up to 40% of cases.
- Studies have shown consistently decreasing sperm quality in the since the beginning of the 20th century.
- The latest joint study from the Haifa Technion and Carmel Medical Center in Israel compared cell phone use patterns and sperm quality. The results suggest a link between Male infertility and cell phone use.

    - 47% of subjects who kept their cell phones two feet or less from their body showed abnormally low semen concentration (low enough to cause infertility) vs only 11% of the general population.

- Speaking on a cell phone for just an hour a day doubles the risk of infertility.

- RF and EMR radiation from cell phones is to blame.

# Electromagnetic Intolerance

# Electromagnetic Sensitivity

## Electromagnetic Sensitivity

**Definition** | **Symptoms** | **Treatment** | **Risk Factors** | **Research**

### Definition

Electromagnetic Sensitivity, also known as *Electromagnetic Hypersensitivity (EHS)* or *electrosensitivity*, is a condition in which an individual experiences symptoms like headaches, dizziness, unusual heart palpitations, or insomnia, around wireless technologies or electrical devices such as smart meters, cell towers, Wi-Fi, mobile phones, cordless phones, power line magnetic fields, intermediate frequencies, and electric fields from various electronics devices.

### Symptoms

- "**Neurological**: headaches, dizziness/nausea, memory and concentration difficulties, insomnia, depression/anxiety, fatigue/weakness, numbness/tingling, muscle and joint pains.
- **Cardiac**: heart palpitations, shortness of breath, heart arrhythmias, high blood pressure.
- **Eyes**: pain/discomfort, pressure in the eyes, deteriorating vision, cataracts.
- **Ears**: ringing in the ears, hearing loss.
- **Other**: skin problems, digestive problems, dehydration, nosebleeds, impaired sense of smell and light sensitivity."

-Taken from **EMFacts Consultancy's Consumer Health and Safety Advice**.

### Warnings about Chronic, Continual Exposure

According to **Hecht and Balzer**'s analysis of 878 scientific works from Russian medical literature, the symptoms may take 3-5 years of exposure to emerge. Within the first 5 years, avoiding or reducing exposure may eliminate symptoms. However, after 10 years, severe symptoms and disease may become evident.

**Hecht and Balzer's Analysis Regarding Chronic Exposures to Microwaves**

| 0-3 years | 3-5 years | 5-10 years | 10+ years |
|---|---|---|---|
| Few or No symptoms | Mild symptoms | Moderate symptoms | Severe symptoms Approaching disease |

Dr. Belpomme, Oncology Professor at Paris Descartes University, found there is more than one phase of **electromagnetic intolerance syndrome**. What starts out as symptoms to a particular frequency, e.g., ear pain from cell phone use, may in a later phase, develop into sensitivity to a wide range of frequencies.

Note: With acute levels of radiation, e.g., living directly under a cell tower, moderate to severe symptoms could arise in less than one year.

### Scientific Research on EHS

A literature review on EHS research by Stephen J. Genuis et al. can be found in the journal, *Science of the Total Environment*, **Electromagnetic Hypersensitivity: Fact or Fiction?**. See also the Environmental Health Trust's **electromagnetic sensitivity page** and the BioInitiative website's compilation of **Electrohypersensitivity Abstracts (2012)**.

Possible scientific explanations for the symptoms of electromagnetic hypersensitivity are provided in the following table:

**Possible Scientific Explanations for EHS Symptoms**

| Symptom | Possibly Related Objective Effects/Animal Research |
|---|---|
| Headache | Opening of the Blood-brain barrier, effects on the dopamine-opiate systems of the brain, and blood cell clumping. See **References** |
| Cardiovascular problems | Calcium efflux in animals' hearts; Arrhythmia in animals; Tachycardia in double-blind study with DECT cordless phones (See Magda Havas's **video** and **References**.) High blood pressure found in double-blind studies (see Devra Davis' book Disconnect). |
| Tinnitus | A study at the University of Vienna (Hans-Peter Hutter et al, 2010) found that risk of tinnitus increased with years of cell phone use. |
| Immune Problems | The RNCNIRP 2011 mentioned that a number of papers published in 2010 showed immune response to RF EMF and that chronic RF EMF exposure may lead to "borderline psychosomatic disorders." See also the **Bioinitiative Report section on immune system effects**. |
| Memory loss | Reduced synaptic activity in hippocampus neurons; Memory loss and neuronal death observed in rats; See **References.** |
| Sleeping Disorders like Insomnia | EMF reduces levels of melatonin; 3 hours of exposure prolongs latency to reach first cycle of deep sleep, and decreases stage 4 sleep (see **reference**) |
| Depression | Affects blood levels of serotonin in participants within 300m of a cell site. See **References** |
| EHS symptoms | **Certain types of EMF have been found to damage Myelin**. Myelin provides electrical insulation for the nervous system. |

Evidence of biological harm from EMF's consists of a variety of sources, including:

- **Objective findings** such as changes to neutrotransmitters, DNA breaks, free radical increase, and brain glucose metabolism,
- **EHS Biomarkers** have been developed by the Austrian Medical Association and Russia Center for Electromagnetic Safety.
- **Double-blind studies** showing impacts on the heart and blood pressure,
- **Epidemiological studies** of cancer around cell towers, radio towers, TV towers, and electricity towers.
- **Mental health studies on youth** showing increased symptoms from cell phones and Wi-Fi,
- **Survey studies** near base stations (cell towers/masts) showing increased symptoms with proximity to the base station,
- **Animal studies**, and
- **Plant studies**

Read more about possibly related **health conditions** like infertility, cancer, sleep disruptions, arrhythmia, neurological disease, ADHD, immune system disorders, asthma, etc. For some scientific mechanisms which may explain the symptoms, refer to the **science overview**.

## Double-Blind Studies

The following are some double-blind studies regarding EMF biological effects:

- A double-blind study showed that electrosensitive individuals experience **Tachycardia** from DECT cordless phones (Magda Havas)
- A rise in **blood pressure** was found from a double-blind study on ten healthy individuals after 35 minute exposures to digital cell phones.
- A female physician develops electrosensitive symptoms following initiation of EMF exposure ($P < 0.05$) (**International Journal of Neuroscience**, 2011)

**Note:** For a list of common deficiencies of double-blind studies which claim that patients cannot sense radiation better than chance, see **Common Deficiencies of Double-blind Studies on Electrosensitivity**.

## Mobile Phone Base Stations (Cell Tower) Studies

Typically within 300-400 meters of mobile phone base stations, increased reports of subjective symptoms are observed, including the following: **Fatigue, headache, sleep disturbance, discomfort, irritability, depression, loss of memory, dizziness, nausea, loss of appetite, visual perturbations, concentration difficulty, and cardiovascular problems.** See the links below for some sample abstracts:

- France: R. Santini et al., July 2002 (**PubMed ID 12168254**, **PubMed ID 12168254)**
- Spain: E. Navarro et al., 2003 (***The Microwave Syndrome: A Preliminary Study in Spain.***)
- Poland: A Bortkiewicz, 2004 (**PubMed ID 15620045**).
- Egypt: Abdel-Rassoul et al., 2007 (**PubMed ID 16962663**) and Emad F. Eskande et al., 2011 **(sciencedirect)**

- Germany: Kempten West, **Mobilfunk in Kempten West**

Wi-Fi can provide even greater exposures than mobile phone base stations and therefore there are similar concerns for Wi-Fi exposure.

## Individual Risk Factors for Electrosensitivity

Some of the following potential risk factors for electrosensitivity may account for the variation of responses from different people:

- **5-10 years** of 24x7 exposure to wireless radiation, intermediate frequencies/dirty electricity, or high powerline electric and magnetic fields.
- **Metals**: Silver mercury amalgam fillings, iron overload in the brain (see Iron below), metal implants, and wearing of metallic jewelry, may be a risk factor. With silver amalgams, some studies suggest that mercury release from amalgams may be greater in the presence of EMF. Furthermore, metals may also act as an antenna and increase local RF energy absorption. Other metals like aluminum may also be potential metal toxins.
- **Iron**: **Dr. Irigaray** talks of iron oxides in the brain called magnetosomes, whose quantity varies per individual, and which may be a risk factor in electrosensitivity. For example, we have a study by Henry Lai suggested that microwave radiation increases free radicals via iron-catalyzed Fenton cycle. Furthermore, a study by Maaroufi et al suggests that lower frequencies in the kHz range may increase oxidative stress for rat brains that have iron overload. Accumulated iron in the brain may also be a risk factor in Multiple Sclerosis, Alzheimer's, and Parkinson's.
- **Genetic problems** for correcting EMF-induced DNA breaks
- **Poor Nutrition**: Lai/Singh found that EMF-induced DNA damage could be partly blocked with antioxidants used before and after exposure.
- **Toxins** may make some people more vulnerable. Microwaves, by opening the blood brain barrier, may make people more vulnerable to toxins by letting them pass through the protective barrier. There appear to be some MCS (multiple chemical sensitivity) individuals who also have electrosensitivity. According to Genuis's literature review, one Swedish study found people with EHS had higher levels of PBDE's, a flame retardant.

## Treatment for Electrosensitivity

- For exposures that are unavoidable, check the **Protection** page for shielding solutions and the **Distance** page for optimal distances.
- Experimental results have also shown that **Nutrition** can provide some protection against EMF's.
- The best treatment, however, seems to be the reduction of **electric fields** (especially important for healing), **dirty electricity, or intermediate radio-frequencies**, **magnetic fields**, and wireless radiation.
- For more detailed information on precautions to take, check the **Precautions** table.

## The Emergence of Electrosensitivity Worldwide

Electrosensitivity is a growing problem. As early as the late 1980s, Swedish telecom engineer, Per Segerback, and many of his colleagues, developed electrosensitivity near a cell tower. His story has been featured in Fortune magazine, Popular Science magazine, and the video documentary, ***Public Exposure: DNA, Democracy, and the Wireless Revolution***. Since then, the problem has now spread *worldwide*. Below is a partial list.

In 2011, the Parliamentary Assembly of the Council of Europe adopted a resolution on the potential dangers of electromagnetic fields on the environment. This resolution includes evidence for electrosensitivity and calls for measures to protect electrosensitive individuals. **Sweden**, **Canada** (the Canadian Human Rights Commission), and **Spain** have also provided some limited level of recognition for electrosensitivity as an environment-related disability. Efforts are being made to gain formal recognition from the World Health Organization for both **EHS and MCS** (Multiple Chemical Sensitivity).

| Country | Reports of Electrosensitivity |
|---|---|
| **USA** | - The **BBC** reported in 2011 that many EHS are flocking to the radio-free zone of West Bank, Virginia to escape EMF's.<br>- The EMR Policy Institute compiled **personal affidavits** across the USA to protest FCC's upcoming broadband wireless plan.<br>- Recently, the roll-out of **smart meters** is rapidly adding even greater numbers to the EHS population, since some of these devices transmit frequently and at levels stronger than cell phones. |
| **Canada** | Schoolchildren in Simcoe county develop symptoms of EHS due to Wi-Fi installations in the school. See **CBC News** and **Safe School Committee**. |
| **Sweden** | Electrosensitivity (Eloverkansligas) is today recognized as a disability in Sweden, where it is estimated to affect as many as 230,000 Swedes. See **"Black on White"** which includes Swedish testimonies. |
| **France** | - In 2008, France National Library switches from Wi-Fi to wired internet as a result of health complaints of staff workers.<br>- Later, in 2009, Next-Up created the first **radiation free refuge** in the Drome in France for people with electrosensitivity (electrosensibilite) who are having difficulty living in urban environments.<br>-Dominique Belpomme performed research on more than 200 people who considered themselves electrosensitive, with clinical and biological analyses to support that the condition is real. |
| **Italy** | A similar refuge zone as the one in France was opened in Italy in 2010. |
| **Spain** | In 2011, a **Labor Court recognized** a college professor as permanently incapacitated by electrosensitivity (electrosensibilidad) |
| **UK** | Anecdotes of electrosensitivity abound in the UK as well, for example, in this article, **Making Waves** in The Guardian from 2004. |
| **Germany** | See **videos** of electrosensitivity (elektrosensibilitat) in Germany. |

| | |
|---|---|
| **India** | In India, there are recent 2010 reports from Tehelka that India's urban areas may violate safety standards, including **Delhi**, **Mumbai**, and **others**, and at least one person has developed electrohypersensibility, and many have developed cancer. Note that the individual mentioned with electrohypersensibility is one of the earliest adopters of cell phones in India. |
| **Taiwan** | See **videos** of concerns in Taiwan of long-term health effects of wireless technology (last video). |
| **Korea** | A Korean epidemiology study on 501 high school students found greater rates of depression amongst those who used cell phones the most. See **Mental Health Studies on Children**. |
| **Japan** | See a video on **Electrosensitivity in Japan** from cell towers. |
| **New Zealand** | Health symptoms were found around the radio tower in Ouruhia, New Zealand, including ringing in the ears and cardiac symptoms. |

## Resources

- Brian Stein, Full Electromagnetic Sensitivity, Lecture **Part 1**, **Part 2** by Electromagnetic Man
- **The Triggers and Symptoms of ES**, from Powerwatch UK
- **Powerwatch UK website on Electrosensitivity**
- **Environmental Medicine Evaluation of Electromagnetic Fields** by Oberfield from Salzburg, Austria. Covers many aspects of EMF and how they relate to health. See especially the section on microwaves.
- **Commonwealth Club Program on Health Effects of Cell Phones, Wireless Technologies & Electromagnetic Fields**
- **WHO workshop in Prague** on electrosensitivity.
- **Neil Cherry Report**, Figures 13 and 20 suggest that even 0.1 $\mu W/cm^2$ = 1 $mW/m^2$ is not adequately safe.
- For safety standard recommendations from the Salzburg Resolution, the Seletun Scientific statement, and the Bioinitiative Report, see **Wireless Safety Standards**
- See **Environmental Medicine Matters** for comments on differences observed for those adversely impacted by EMF's versus chemicals.
- Olle Johansson of the Karolinska Institute in Sweden and Magda Havas, professor at Trent University in Canada, are two scientists who study electrosensitivity. See the double-blind study by Magda Havas on arrhythmia from DECT cordless stations.

Soz Praventivmed. 2006;51(4):202-9.

# The prevalence of symptoms attributed to electromagnetic field exposure: a cross-sectional representative survey in Switzerland.

Schreier N[1], Huss A, Röösli M.

**Author information**

## Abstract

**OBJECTIVES:** To investigate health risk perception as well as to assess the prevalence of self-reported symptoms attributed to electromagnetic fields (EMF) and other environmental exposures in the general population of Switzerland.

**METHODS:** Between May and June 2004, telephone interviews of a representative sample of the Swiss population (n=2048, >14 years old) about: (1) health symptoms attributed to five environmental factors (one of which was EMF), (2) health risk perception related to 12 environmental risk factors (five of which were different EMF sources).

**RESULTS:** We found a prevalence of 5% (95% CI 4-6%) for **electromagnetic hypersensitivity** (EHS) in our study sample. The most common health complaints among EHS individuals were sleep disorders (43%) and headaches (34%), which were mostly attributed to power lines and mobile phone handsets. In addition, 53 percent (95% CI 51-55%) were worried about adverse health effects from EMF, without attributing their own health symptoms to them.

**CONCLUSIONS:** The large proportion of the population who is concerned or attributes own symptoms to EMF may cause societal conflicts given the ubiquity of EMF in our everyday life.

### Comment in

Electromagnetic fields, science and public concern. [Soz Praventivmed. 2006]

PMID: 17193782

[PubMed - indexed for MEDLINE]

### Publication Types, MeSH Terms

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SO MANY
INTERNATIONAL
PLEAS FROM SCIENTISTS
TO THE 'WHO'.

THIS IS BUT ONE.

**In May 2015, 190 scientists from 39 nations submitted an appeal to the United Nations**

## Appendix 1: Scientists call for more protective measures, given increasing evidence of risk from EMFs

In May 2015, 190 scientists from 39 nations submitted an appeal to the United Nations, UN Member States and the World Health Organization (WHO) requesting that they adopt more protective exposure guidelines for electromagnetic fields (EMFs) and wireless technology in the face of increasing evidence of risk.

All of the scientists have published peer-reviewed papers on the biological or health effects of non-ionizing radiation—part of the EMF spectrum that includes extremely low frequency (ELF) fields used for electricity, or radio frequency (RF) radiation used for wireless communications. The appeal was launched by Dr Martin Blank, who has over 30 years' experience conducting EMF research at Columbia University and is former president of the International Bioelectromagnetics Society. He gives a compelling explanation of the major health crisis we are facing due to increasing levels of environmental pollution from growing and expanding EMF sources.

The appeal calls for precautionary measures, to limit EMF exposures, and to educate the public about health risks, particularly to children and pregnant women, and asks the United Nations, WHO, UNEP and UN Member States to:

- address the emerging public health crisis related to cell phones, wireless devices, wireless utility meters and wireless infrastructure in neighborhoods; and
- urge that the United Nations Environmental Programme (UNEP) initiate an assessment of alternatives to current exposure standards and practices that could substantially lower human exposures to non-ionizing radiation.

"International exposure guidelines for electromagnetic fields must be strengthened to reflect the reality of their impact on our bodies, especially on our DNA," says Dr Blank. "The time to deal with the harmful biological and health effects is long overdue. We must reduce exposure by establishing more protective guidelines."

The appeal highlights WHO's conflicting positions about EMF risk. WHO's International Agency for Research on Cancer classified radiofrequency radiation as a Group 2B "possible carcinogen" in 2011, and extremely low frequency fields in 2001. Nonetheless, WHO continues to ignore its own agency's recommendations and favours guidelines recommended by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). **These guidelines, developed by a self-selected group of industry insiders, have long been criticized as non-protective.**

Dr Joel Moskowitz, PhD, of University of California, Berkeley, says: "ICNIRP guidelines set exposure standards for high-intensity, short-term, tissue-heating thresholds. These do not protect us from the low-intensity, chronic exposures common today."

there is not enough information particularly relating to children to be sure

The appeal calls on the UN to strengthen its advisories on EMF risk for humans and to assess the potential impact on wildlife and other living organisms under the auspices of the UN Environmental Programme, in line with the science demonstrating risk, thereby resolving this inconsistency.

See: http://www.emfscientist.org and http://goo.gl/sLi7Uu

https://emfscientist.org/index.php/emf-scientist-appeal

# INSURERS ALREADY KNOW THE RISKS

**Underwriters deny insurance for EMR risks.**

# Wi-Fi alert: School officials may be personally liable for exposing children to wireless radiation

(NaturalHealth365) School districts, school boards and school medical health officers in Canada have been notified that Lloyd's of London has now excluded any liability coverage for injuries, "directly or indirectly arising out of, resulting from or contributed to by electromagnetic fields, electromagnetic radiation, electromagnetism, radio waves or noise." This includes the radio frequency radiation emitting from Wi-Fi and other wireless devices in schools.

On February 18, 2015, the UK agent for Lloyd's stated, "the Electromagnetic Fields Exclusion (Exclusion 32) is a General Insurance Exclusion and is applied across the market as standard. The purpose of the exclusion is to exclude cover for illnesses caused by continuous long-term non-ionizing radiation exposure i.e. through mobile phone usage."

## Lloyd's of London understands the dangers of Wi-Fi radiation

This decision is important because Lloyd's of London, one of the largest insurance companies in the world, often leads the way in protection by taking on risks that no one else will. But, the decision is not surprising because Lloyd's refused to cover mobile phone manufacturers against risks to users' health more than a decade ago in 1999.

**What (exactly) are the risks associated with Wi-Fi radiation?**

In 2011, the World Health Organization designated radio frequency radiation of the type emitted by Wi-Fi devices to be a 'class 2B possible human carcinogen.' Many independent experts now think this classification downplays the significant dangers posed by wireless technology – especially when you consider the thousands of peer-reviewed, non-industry funded studies by scientists and medical experts that show that Wi-Fi radiation is harmful, especially to children.

**Editor's note:** If you want to see more about this topic – check out our sections on EMF pollution; smart meter dangers and the NaturalHealth365 Podcast called "Wireless technology: Security risks and dangers exposed".

http://www.pemfglobal.com/2015/05/22/worlds-largest-insurance-company-no-longer-covers-electromagnetic-radiation/

# THE BIOINITIATIVE REPORT FROM NON INDUSTRY AFFILIATED SCIENTISTS.

**THIS DISAGREES WITH 'WHO' FINDINGS THAT ARE BASED ON DECADE OLD DATA.**

**Link only:**

http://www.bioinitiative.org/potential-health-effects-emfl