

THE LEGISLATOR'S GUIDE TO WARNING LABELS ON CELL PHONES AND THE LAYMAN'S GUIDE TO THE SCIENCE BEHIND NON-THERMAL EFFECTS FROM WIRELESS DEVICES.

WHY SAR FAILS TO PROTECT HUMAN HEALTH AND HOW THE MERE POSTING OF SAR ON CELL PHONES IS DANGEROUS AND MISLEADING TO CONSUMERS

FCC/DANGEROUS AND MISLEADING GUIDANCE OMINOUS INFORMATION FROM INDUSTRY - MOTOROLA PUTS BRAIN CANCER STUDIES AND DISCLAIMERS IN THEIR MANUALS

THE SIGNIFICANCE OF THE FIRST EVER NON-THERMAL WARNING LABEL INTRODUCED IN OREGON PLUS SUGGESTED LANGUAGE FOR LEGISLATORS

A TABLE OF STUDIES SHOWING HEALTH EFFECTS AT LEVELS FAR LOWER THAN CURRENT SAR SAFETY STANDARDS AND A BREAKDOWN OF THE SCIENCE IS LAYMAN'S LANGUAGE

HOW THE SWISS GOT IT RIGHT:

SWISS RE SAYS "NO" TO INSURANCE AGAINST CELLPHONE RELATED HEALTH CLAIMS.

SWISS-COM SAYS YES TO GENETIC DAMAGE, CANCER FROM NON-THERMAL EXPOSURE TO CELL PHONES, CELL TOWERS AND WIRELESS INFRASTRUCTURE

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This paper is dedicated to all the local legislators who would like to take action on this issue but think they can't and to all the victims of uninformed, involuntary and dangerous wireless radiation exposure everywhere in the world, in hopes that it may shed light on the complicated and dark cloud that is the science of wireless electromagnetic radiation and health effects as well as help empower you to take legislative actions to protect yourselves, your loved ones and the rest of our planet's inhabitants. May we be successful in our fight for our health and lives and put an end to involuntary electromagnetic radiation exposure...before it puts an end to us.

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FOREWORD

For far too long, the science behind the health effects of cell phones, wireless devices has been shrouded in a cloud of complex biology, physics, engineering and other sciences, not to mention the ability of a multi trillion dollar a year industry to both influence federal government regulatory agency safety standards as well as fund scientific studies which are to it's liking, while masking results of studies showing health effects by claiming "faulty study protocol set up" or even worse, masking results from studies showing health effects by skewing the findings themselves when they do find an effect.

This is an impressive array of stumbling blocks for any well intentioned legislator, city councilman or even concerned citizen, when trying to wade through the maze of smoke and mirrors that is the issue of cell phones and health effects and do something meaningful about what they inherently know to be a problem of unprecedented enormity, with real life and death consequences.

Many citizens, local councils and state legislators inherently trust our federal government agencies to protect public health with the same fervor with which they protect their own and industry's financial health. Sadly, this has proven to be untrue in regards to this issue.

And finally, there are some industry propagated myths, both with and without federal government backing...that the current SAR safety standards protect human health (this myth has the federal government seal of approval) and that cities and states do not have the right to protect themselves when it comes to health effects from cell phones and wireless PDAs.

This paper aims to put to rest the myth that local communities and states cannot inform and protect their own citizens when it comes to cell phones and other wireless devices and health effects and also attempts to explain in a simple way, what has been shrouded from the public's awareness...the science behind non-thermal **(non heat related)** effects from cell phones and other wireless devices, so that the average legislator, government agency employee or citizen with no special scientific background, can fully grasp the nature of this extremely serious health hazard. In light of the ever increasing public demand and need for transparency and protection regarding the issue of cell phones and health effects and legislators confusion about what exactly it is they can do to help on this issue, we offer both legal standing and scientific evidence for suggested language to assist city and township councilmen/women and legislators in their quest to inform the public and protect their citizens from the costly, debilitating and potentially deadly health effects from cell phones, via informational warning labels, whilst remaining within the law.

Although warning labels on cell phones seems like a small thing, it is an enormous step in the right direction in terms of the immediate protection of our children's health and safety and the health and safety of those of us who utilize these wireless

devices for our business needs or any other part of our daily lives. The absolute urgency for health warning labels on cell phones is evident in this paper, particularly when we look at some of the statistics for children and brain tumors when beginning cell phone use before the age of twenty. **Every year of uninformed cell phone use in these early years is critical to the health and well being of each child, who have a 420% increased risk of contracting a brain tumor with greater than 1 year of cell phone use.** The statistics for adults are quite sobering as well. *In fact* there are many other health effects that both adults and children may be spared with just a little knowledge about the facts. With all the information we currently have on this issue, there is no excuse anymore for anyone to be in the dark about cell phones and health effects...especially **non-thermal** health effects.

As we will see in the below breakdown of studies, current SAR (**specific absorption rate, or the amount of radiation the cell phone emits and is absorbed into our tissue**) safety standards are based on thermal (**heating**) effects only and **do not protect public health. These same nonsensical standards based on thermal effects alone apply to all wireless, radiation emitting devices.**

The legislator's job is to represent both industry and the public in a fair way. Thus far, the only one getting any fair treatment has been industry. The public's cry for transparency and truth in science has been largely ignored...not from any fault of the legislators, it would be expected to trust in our federal government agency regulations. However, these standards have been created with industry influence and supported by regulators who have the contradictory roles of promoting revenue from the very industries they are tasked with regulating and this agenda has been promoted over public health and safety.

As city councils, state legislators and average citizens begin to arm themselves with vital scientific information, as well as their legal rights to protect themselves, the playing field will become more level and public health and safety will play a bigger role in legislative actions.

When the scientific playing field is not level and the independent studies are out-funded and out-numbered by industry studies showing "no effect", history has proven it usually takes a substantial "body count" or a plaintiff to win a lawsuit in order for federal legislation to be enacted. This is typical of industry dominated science disguising itself as government agency safety standards. Either scenario may take decades, during which time innocent and trusting children's and adult's health and lives are in harm's way by unwittingly utilizing these products in question with a false sense of security.

Innocent and trusting citizen's fate should not have to depend on whether a substantial body count is reached, nor the lengthy legal process of outwitting the industry at their own dangerous game of cat and mouse with the health and lives of ourselves and our children in favor of one more year of staggering profits and postponing the inevitable...legislation that is protective of public health.

NON-THERMAL...

A PUBLIC POLICY DEFINITION AS OPPOSED TO A SCIENTIFIC DEFINITION

It is important to note that when we use the term “**non thermal**”, we are only referring to levels below 1.6 W/kg (**watts per kilogram of tissue**) since that is the number by which the FCC has set our current health and safety standards. This threshold for health effects was set by the FCC with consult from industry associations.

According to our government agencies, anything over 1.6 W/kg is in danger of heating or thermal effects. Anything *under* 1.6 W/kg is according to our government agencies, “*non-thermal*” and *not* in danger of heating or thermal effects, therefore, supposedly not a threat to human health. Thermal energy is created by the oscillation of cells or even the vibration of atoms. Technically the term “non-thermal” could mean no heat, or no vibration of atoms. However, when used in the context of EMF, the term non-thermal refers to “no temperature rise”. **Some scientists believe *all non-ionizing radiation is thermal, even at very miniscule levels, because the cells are oscillating or atoms are vibrating, thereby generating a certain amount of heat even if it is infinitesimal.***

So throughout this paper, reference to “**non-thermal**” refers to our government regulatory agencies use of the term...anything below 1.6 W/kg.

Additionally, there are **properties or characteristics** of the transmissions or radio waves that are also considered to be **non-thermal**, but highly toxic and potentially deadly. Some of these non-thermal properties are discussed in this paper and can be considered to be in a different category than temperature. They are simply parts of the way the information on the radio wave is delivered to our bodies.

The most important thing to understand throughout, is that regardless of what is considered thermal and non-thermal, there are biological and health effects found far ***below*** the threshold of 1.6 W/kg, that the evolution of this technology is advancing very fast with absolutely no regard for the impact on human health, that there are characteristics of the transmissions that can be considered in a different category than heat altogether and that the current ***SAR safety standards do not account for any of this and do not protect human health*** from a myriad of deadly health effects and illnesses, including cancer and genetic damage. So this means either heat is found below 1.6 W/kg, or there is something else going on in the transmission that is unrelated to heat that is causing the biological and health effects, or both. We address both of these **non-thermal** issues in this paper.

THE SIMILARITIES BETWEEN IONIZING AND NON IONIZING RADIATION

If the radiant energy directly produces ions (**charged particles which can lead to cancer**) it is ionizing. If the radiant energy does not directly produce ions, it is non-ionizing.

The process of ionization directly strips electrons from atoms and molecules creating charged particles and free radicals (**similar to charged particles but more mobile**) and directly damages DNA. When charged particles and free radicals outdistance the body's ability to compensate and repair damaged DNA, serious illness including cancer can occur.

Although some physicists claim that non-ionizing radiation does not have enough energy to directly damage DNA, whether directly or *indirectly*, it **does damage DNA, it does create charged particles and free radicals**, it does all this at *non-thermal* levels and these effects **can cause cancer and other serious illnesses**.

Thus the distinction between ionizing and non-ionizing radiation is misleading as **both types of radiation can cause nearly all of the same type of health effects, including cancer and genetic damage. Similarly, the distinction between thermal and non-thermal levels of non ionizing radiation is also misleading for the exact same reasons.** This misleading reputation of non-ionizing radiation at **non-thermal** levels has been fostered by industry groups, universities with industry sponsored grants and federal government agencies as being "safe" even though peer reviewed, published, replicated and independent studies show that it is highly toxic, dangerous and potentially deadly.

The current safety standards neither take into account these harmful and potentially lethal biological and health effects from non-thermal levels of non-ionizing radiation, ***nor does purchasing a lower SAR value phone protect from or even lessen these non-thermal effects. In fact, a lower SAR phone may actually increase certain effects, such as blood brain barrier permeation (see Less Power Density, pages 54-60).***

Many mitigating steps can be taken to reduce radiation exposure to the public. The posting of **warning labels** is merely an immediate first step that can be taken easily and quickly, with **no federal pre-emption** and at very little cost.

WHY A HEATH WARNING AND NOT MERELY POSTING SAR...

In June, 2010, the city of SF, CA enacted a law which demands all cell phones post the level of SAR on the packaging. **However, the mere posting of SAR on cell phones is not only useless for the purposes of protecting human health, but can actually mislead consumers into the false sense of security that they are safer from cell phone induced illness and death merely by purchasing a lower SAR value phone.** In fact, we would go so far as to say that the general population may even be emboldened and parents may allow their children to stay on the cell phone *longer* with this new, false sense of security of purchasing a lower SAR value phone. This new, false sense of security could lead to even more radiation exposure than they were getting before the SAR values were placed on the phones.

Recently, the FCC posted statements on their website regarding the potential to mislead the consumer by posting SAR on cell phones, but for a completely different reason than what we are referring to here in this paper. Although we are on the same page with the FCC and the CTIA about the potential to mislead consumers by posting SAR, the FCC and CTIA's reasoning is that all cell phones fall within the "safety limits" and posting SAR could give consumers the impression that a lower emitting SAR phone is safer when it is not.

The difference in our stance and that of the FCC and CTIA is what we are saying is **NONE of the phones currently on the market have been tested for and issued safety standards for non-thermal effects.** Therefore, none of the cell phones on the market that fall within the current SAR safety standards protect human health or should be considered "safe". **The current safety standards are based on thermal effects only, completely ignoring all non-thermal, biological and health effects and that lower SAR phones in particular, including bluetooth devices worn on the ear, may expose the consumer to easier blood brain barrier penetration.**

As we will see in the studies below, *less power density does not always mean safer* when it comes to non-thermal effects from non-ionizing radiation.

Based on the fact that current FCC safety standards blatantly disregard all non-thermal biological and health effects and factor into the safety standards *only* thermal biological effects, and based on the fact that they have been apprised about this issue numerous times, we see this as tantamount to the public being "lied to by omission" about the potential health effects from non-ionizing, radiation-emitting devices at non-thermal levels.

<http://www.fcc.gov/cgb/consumerfacts/sar.html>

<http://www.fcc.gov/cgb/consumerfacts/mobilephone.html>

We include in this paper, statements from the FDA, FCC, EPA, cell phone manufacturers and CTIA (formerly Cellular Telecommunications Industry Association, now Cellular Telecommunications Internet Association), clearly questioning the safety of cell phones and even outright stating that there may be health risks with the use of cell phones. Currently, it seems...

The only ones in the dark about this serious health hazard are the consumers.

Because the current SAR safety standards do not include non-thermal effects, they do not protect against cell phone induced brain tumors or a whole host of other serious illness including but not limited to...

Acoustic neuroma

Alzheimer's (If Alzheimer's is caused by plaque build up in the brain and neurotransmitter problems, then it is entirely conceivable that BBB leakage could lead to such an illness)

Arrhythmia

Benign brain tumors

Birth Defects

Blood brain barrier (BBB) leakage, which can lead to early Alzheimer's, Parkinson's disease, ALS, and of course ADD/ADHD and other neurological illnesses.

Dementia

Leukemia

Lymphoma

Malignant brain tumors

Permanent genetic damage (meaning passed down through the generations)

Sperm and reproductive damage

...all of which are non-thermal effects from non-ionizing radiation.

Recently, an excellent science paper by Livio Giuliani and Morando Soffritti on **non-thermal, non-ionizing** radiation was published...

http://www.icems.eu/papers/ramazzini_library5_part1.pdf

Despite the existence of THOUSANDS of studies showing non-thermal biological and health effects from non-ionizing radiation <http://www.bioinitiative.org> and even though our military recognizes and utilizes non-thermal effects from non-ionizing, radiation-emitting devices and weaponry because of the negative biological and health effects on the human body and medical doctors utilize non-thermal effects from non-ionizing, radiation-emitting devices for medicinal treatments because of the positive biological and health effects, the FCC refuses to publicly recognize any non-thermal health effects from non-ionizing

radiation at all. Therefore, they are excluded from the current SAR health and safety standards.

The FDA which traditionally sets health and safety standards for radiation emitting devices **has opted out of doing so for the cell phone...**

“Under the law, FDA does not review the safety of radiation-emitting consumer products such as mobile phones before marketing...”

<http://www.fda.gov/radiation-emittingproducts/radiationemittingproductsandprocedures/homebusinessandentertainment/cellphones/default.htm>

Additionally, the FCC which did set the health and safety standards for cell phones **does not hold health and safety in their job purview...**

“The FCC was established by the Communications Act of 1934 and is charged with regulating interstate and international communications by radio, television, wire, satellite and cable.”

<http://www.fcc.gov/aboutus.html>

Per the above job purview, the FCC is totally unqualified to set health and safety standards for *any* product let alone cell phones and has relied upon industry associations like IEEE, whose interests in ignoring biological effects at non-thermal levels are clearly financially motivated. In fact...

“The Commission has stressed repeatedly that it is not a health and safety agency and would defer to the judgment of these expert agencies with respect to determining appropriate levels of safe exposure to RF energy.”

http://www.fcc.gov/Bureaus/Engineering_Technology/Orders/1996/fcc96326.pdf
(paragraph 28)

Here is an excerpt from the opening statement on the recently updated FCC website...

“there is no federally developed national standard for safe levels of exposure to radiofrequency (RF) energy”

<http://www.fcc.gov/cgb/consumerfacts/mobilephone.html>

Until such time as our federal government agencies choose to protect human health by incorporating **non-thermal** effects into safety standards for non-ionizing radiation-emitting products and devices, states and cities need to protect their own citizens. **Warning labels on cell phones are a first line of defense in the fight against non-thermal effects from non-ionizing radiation emitting devices** in addition to other mitigating steps that can be taken to inform and protect citizens such as add campaigns to raise the public's awareness, utilizing hard wired technology whenever possible and using wireless devices in emergencies only, as the manuals state.

MISLEADING INFORMATION, DANGEROUS AND IRRESPONSIBLE GUIDANCE TO CONSUMERS ON FCC WEBSITE...

The following statements on the recently updated version of the FCC website on health and safety regarding cell phones are false or misleading ...

“currently no scientific evidence establishes a causal link between wireless device use and cancer or other illnesses”

In the words of Swiss Re, the worlds largest re-insurance company who will not insure health claims from cell phones, we offer the following statements from their manual...

“Should we someday know what role weak electromagnetic fields play in cancer, then it will only be because we will also know what causes cancer.”

“While classical science considered a cause to be only that which must necessarily bring about an effect as a result of the causal principle, today a cause is also considered to be that which may bring about an effect.”

“...As soon as it can be demonstrated that one of these factors discernibly increases the probability of the effect, however, we refer to it as a cause. The decisive criterion for causality is therefor only that a thing discernibly increases the probability that an effect will occur.”

“In this case it would be sufficient to prove that weak fields can increase the probability of disease.”

“...according to our present understanding - electromagnetic fields would be a cause of disease just like flu virus which may, but need not necessarily, result in influenza.”

“In an ever increasing number of apparently coincidental relationships, science is now discovering statistical laws which are like-wise being described as causal in nature.”

*To this day, the tobacco industry argues we still do not have a mechanism by which cigarettes form lung cancer. Yet we know it does. To say that we need a **causal** link between cell phones and brain cancer, in the face of the body of peer reviewed, published and replicated studies from around the world on this issue showing DNA*

damage, DNA single and double strand breakage, biological and health effects and epidemiology showing 95% and higher association with cell phone use and brain cancer is incredibly irresponsible and yet another notch in the FCC belt of being the incorrect agency to entrust with the health, safety and lives of the American people when it comes to cell phones and health effects.

When weighing the body of evidence and removing industry funded studies from that body of evidence, there is clear and present danger as well as statistically significant association with cell phone use, brain tumors and many other illnesses.

The FCC continued...

“No scientific evidence currently establishes a definite link between wireless device use and cancer or other illnesses”

The standard for definitive and significant results in science is 95% confidence or higher. All results in this paper have been peer reviewed, published, replicated and meet the 95% or higher scientific standard to be deemed significant. What the FCC should be telling people is that **MANY studies having 95% or higher significant results show BIOLOGICAL and HEALTH EFFECTS, many of which can lead to cancer, genotoxicity and other illnesses in humans.**

IRRESPONSIBLE LANGUAGE AND DANGEROUS GUIDANCE...

“some parties recommend taking measures to further reduce exposure to RF energy. The FCC does not endorse the need for these practices”

The FCC irresponsibly makes the above statement despite the fact that manufacturers are now telling children to keep the phone away from their lower abdomen, pregnant women to keep the phone away from their abdomen, users to keep the phone .98 inches away from their head and body and are publishing brain cancer study information along with the statement that “Some people who have used mobile phones have been diagnosed with brain cancer.” and “When tumors did exist in certain locations, however, they were more likely to be on the side of the head where the mobile phone was used. ”.

*Additionally, the FCC completely **ignores** peer reviewed, published and replicated studies showing greater blood brain barrier permeation at **LOWER power densities and at further distances from the phone.** This is very dangerous for parents who want to keep their children safe from passive*

mobile phone exposure or pregnant women who should be keeping their fetuses safe from “passive mobile phone exposure” as much as possible. Details on this effect are explained in the below breakdown of studies.

“The FCC requires that cell phone manufacturers conduct their SAR testing to include the most severe, worst-case (and highest power) operating conditions for all the frequency bands”

Even at their own definition of worst case scenario, cell phones are not tested for real world use as they are tested using a plastic spacer between the phone plastic model of the head. This “buys space” for the phones to be non-compliant even with their own inadequate standards of 1.6 W/kg. Should they be measured how they are advertised and how people actually use them, held directly against the head, they would most likely exceed even the current inadequate safety guidelines of 1.6 W/kg.

*Again, the FCC **IGNORES** peer reviewed, published and replicated science showing easier RF blood brain barrier permeation at **LOWER POWER LEVELS** as opposed to only higher power levels.*

“What SAR Does Not Show”

The first sentence from the above statement’s section of their website...

“The SAR value used for FCC approval does not account for the multitude of measurements taken during the testing.”

*Given the opportunity to tell the public what SAR does not account for, the FCC has blatantly left out any and all mention of peer reviewed, published and replicated studies with a 95% or higher confidence of biological and health effects, all at non-thermal levels, with frequency bands currently utilized in the US and internationally. They have blatantly left any and all mention of non-thermal levels of frequency, pulse modulation, frequency modulation and power density, all having serious biological and health impacts on cells. This is a tantamount to lying by omission. Additionally, The FCC has **IGNORED** published, peer reviewed science showing that the greatest blood-brain barrier penetration occurs at the **LOWEST POWER LEVELS** not the highest power levels, as one who is not educated in the science or only resorts to industry funded studies for their information might expect.*

Although the FCC claims current “safety standards”, are sufficient for protecting human health, they openly admit...

“there is no federally developed national standard for safe levels of exposure to radiofrequency (RF) energy”

...and although the FCC is totally unqualified to do so, they have set health and safety standards for cell phones in the US.

LEGAL STANDING TO ACT...

The following is an excerpt from a recent Court of Appeals decision...

District of Columbia Court of Appeals

Nos. 07-CV-1074, 07-CV-1075, 07-CV-1076, 07-CV-1077, 07-CV-1078 & 07-CV-1079

Michael Patrick Murray, et al, APPELLEES

V.

Motorola, Inc., et al, APPELLEES

Appeals from the Superior Court
of the District of Columbia

(Nos. CA-8479-01, CA-1368-02, CA-1369-02, CA-1370-02, CA-1371-02 & CA-1372-02

(Hon. Cheryl M Long, Motions Judge)

(Argued January 23, 2009

Decided October 29, 2009)

Page 15 of this case...

"We agree with the *Farina* court that "Congress's intent in enacting [section 332 (c)(3)(A)] was to prevent states from obstructing the creation of nationwide cellular service coverage, and not the preemption of health and safety police powers." *Farina*, 578 F. Supp. 2d at 761; *see also id.* At 758 (nothing in the [statute] expressly preempts state common law designed to ensure the health and safety of cell phone users."

Therefore actions taken to give people fair warning or protect them from harmful radiation from non-thermal effects of non-ionizing radiation emitting devices such as cell phones, cordless phones and wireless PDA's are by law, not federally pre-empted.

THE DECLARATION OF INDEPENDENCE

<http://www.ushistory.org/declaration/document/>

We hold these truths to be self-evident, that **all men are created equal**, that they are endowed by their Creator with certain unalienable Rights, that among these are **Life, Liberty and the pursuit of Happiness**. — That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, — **That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and**

14th Constitutional Amendment

http://en.wikipedia.org/wiki/Fourteenth_Amendment_to_the_United_States_Constitution

No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws..

The law clearly states that states have the right to protect themselves when our federal government fails to do so...

Under the 14th Amendment in the United States Constitution...

The **Equal Protection Clause**, in the [Fourteenth Amendment](#) to the [United States Constitution](#), provides that "no state shall ... deny to any person within its [jurisdiction](#) the equal protection of the laws".

PER THE COMMERCE CLAUSE...

No, we cannot change the safety standards at the local or state level...but yes, we can inform and protect our citizens via informational warning labels, provided these actions are carried out in such a way as they do not interfere with interstate commerce, per THE COMMERCE CLAUSE. The label *must* be applied at the local level, but paid for and provided by the manufacturer. If carried out in this way, local authorities and states may place informational warning labels on cell phones.

Knowledge is power and information is knowledge. Without the vital information, such as is contained in this paper, people will not have the power to make an informed decision about the health and well being of themselves or their children. We have created a sample warning label in the warning label section of this paper for anyone who would like to present it to their local city council or state legislator.

OMINOUS INDUSTRY INFORMATION

INDUSTRY NOW SCRAMBLING TO COVER THEIR BASES, OMINOUS BRAIN CANCER INFORMATION PLACED IN MOTOROLA PHONE MANUALS...

In mid July of 2010, after meeting with and at the request of multiple Senatorial and Congressional offices regarding oversight of the safety of cell phones and wireless PDA's AmericanAssociationForCellPhoneSafety.org with the assistance of legal council, wrote letters of inquiry to the FDA and FCC...

http://www.americanassociationforcellphonesafety.org/uploads/Letter_oF_Inquiry_FCC_Final_7-11-10.doc

To our federal government and regulatory agency's credit, two and a half months later, in Oct. 2010, CHANGES have appeared in the Motorola phone and wireless PDA manuals. Although we commend this minuscule improvement in customer safety information, the information...

- A) Does not go far enough.
- B) Needs to be put on the packaging of al cell phones and wireless PDA's as well as on the cell phone itself.

A couple of the statements below have been there for years with little notice because of the purposely miniscule fine print and placement in the back of the manual, much like the fine print on mortgage loans that caused our nationwide housing bubble crisis. Only these hidden clauses have MUCH more serious life and death implications than the loss of a home.

But many of these statements are new additions as of Oct. 2010. Here are a few excerpts taken directly from two of the manuals.

Our commentary is in italics.

Blackberry Torch...

http://docs.blackberry.com/en/smartphone_users/categories/?userType=1&category=BlackBerry+Smartphones

Page 3:

"keep a distance of at least .98 in. or it may cause your device to exceed RF exposure standards"

“THE LONG TERM EFFECTS OF EXCEEDING RF EXPOSURE STANDARDS MIGHT PRESENT A RISK OF SERIOUS HARM.”

- A) *This begs the question, why are these things allowed to be advertised being held directly against the head as opposed to away from the head and body?*
- B) *Why is this information not on the outside of the phone and packaging where people can plainly see it as with other hazardous products?*
- C) *Since the use of a plastic spacer is used in testing, children are being marketed to and their heads absorb as much as 230% deeper levels of radiation into the brain, why are they not at least told to keep it 230% further away from their heads?*

Page 17

Caution: When using the camera flash, the camera flash LED aperture at least 19.69 in. (50 cm) from the subject's eyes. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Hazardous radiation exposure if not held 20 inches away from someone? This device needs to be REMOVED FROM THE MARKET.

Page 19

The BlackBerry device might not come with a holster (body-worn accessory). If you wear the BlackBerry device on your body, always put the BlackBerry device in a BlackBerry device holster equipped with an integrated belt clip supplied or approved by Research In Motion. If you do not use a holster equipped with an integrated belt clip supplied or approved by RIM when you carry the BlackBerry device, **keep the BlackBerry device at least 0.98 in. (25 mm) from your body when the BlackBerry device is transmitting.**

If it is dangerous not to have this clip, why isn't it mandatory the phone come with it? This notice needs to be on the packaging of the phone and on the phone itself.

Page 23:

Use hands-free if available and keep the Blackberry at least .98 in. from your body, **"INCLUDING THE ABDOMEN OF PREGNANT WOMEN AND THE LOWER ABDOMEN OF TEENAGERS"!!!** (emphasis added)

*A) Why keep away from the lower abdomen of teenagers? **This serious health warning warrants further disclosure and explanation.***

*B) Why should pregnant women keep this product away from their abdomen? **This serious health warning warrants further disclosure and explanation.***

The implications of these health warnings are too serious to be buried in the manual and needs to be placed on the packaging and on the phone itself.

Page 22 and 23

"To reduce radio frequency (RF) exposure consider these safety guidelines:

"A reduced signal display, which might occur in areas such as an underground parking structure or if you are traveling by train or car, might **indicate increased power output from your BlackBerry device as it attempts to connect to a weak signal.**"

Although higher power causes certain effects, the effects from lower power are also quite serious. The above statement makes no mention of easier BBB (blood brain barrier) permeation with lower power density, misleading the consumer into thinking only higher power density is dangerous.

- Use hands-free operation if it is available and keep the BlackBerry device at least 0.98 in. (25 mm) from your body (including the abdomen of pregnant women and the lower abdomen of teenagers) when the BlackBerry device is turned on and connected to the wireless network. For more information about carrying your BlackBerry device, see the holster information in the "Additional

safety guidelines" section of this document.

Makes no mention of easier blood brain barrier permeation up to a distance of approximately 4 feet from phone. This information is vital to pregnant women who want to keep their fetuses as safe as possible since the distance from their head to their abdomen is usually less than 4 feet.

- Reduce the amount of time spent on calls.

This is the only logical recommendation in this section of the manual.

Page 26

The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies.

Use of the word "independent" is misleading. All standards are based on recommendations from industry associations such as IEEE. Periodic evaluation clearly does not include studies performed in the past decade which show 420% increase in brain tumors in children who begin using the cell phone before the age of 20 and with greater than one year of usage.

Page 27

The long-term characteristics or the possible physiological effects of Radio Frequency Electromagnetic fields have not been evaluated by Underwriters Laboratories Inc. (UL).

THIS NEEDS TO BE ON THE COVER AND PACKAGING OF THE PHONE.

This is who Underwriters Laboratories are and what they do...

"UL is the trusted resource across the globe for product safety certification and compliance solutions. Benefiting a range of customers - from manufacturers and consumers to regulatory bodies and code officials - we've tested products for public safety for more than a century."

<http://www.ul.com/global/eng/pages/>

Excerpts from Motorola manual, 120e...*our comments are in italics.*

<http://www.motorola.com/mdirect/manuals/120e.pdf>

page 152...

“FDA has been receiving inquiries about the safety of mobile phones, including cellular phones and PCS phones. The following summarizes what is known—and what remains unknown—about whether **these products can pose a hazard to health**, and what can be done to minimize any potential risk.”

Same page further down...

“However, it is not known whether, to what extent, or through what mechanism, **lower levels of RF might cause adverse health effects** as well. Although some research has been done to address these questions, no clear picture of the biological effects of this type of radiation has emerged to date. **Thus, the available science does not allow us to conclude that mobile phones are absolutely safe**, or that they are unsafe.”

“Questions have been raised about hand-held mobile phones, the kind that have a built-in antenna that is positioned close to the user's head during normal telephone conversation. These types of mobile phones are of concern because of the short distance between the phone's antenna—the primary source of the RF—and the person's head.”

Page 153 of same manual...

“How much evidence is there that hand-held mobile phones might be harmful?”

“Briefly, there is not enough evidence to know for sure, either way; however, research efforts are on-going. The existing scientific evidence is conflicting and many of the studies that have been done to date have suffered from flaws in their research methods. “

Recently, there was a global study called Interphone which was funded by industry/government and did suffer from design flaws. We can only assume that the flaws were intentional, since these flaws were set up by industry and then allowed industry to culminate in throwing out findings of serious illness in favor of studies showing no illness with the excuse of faulty study protocol and also call for another 25 year study (the Cosmos study) trying to buy more time before protective legislation be implemented.

“Animal experiments investigating the effects of RF exposures characteristic of mobile phones have yielded conflicting results. A few animal studies, however, have suggested that low levels of RF could accelerate the development of cancer in laboratory animals. In one study, mice genetically altered to be predisposed to developing one type of cancer developed more than twice as many such cancers when they were exposed to RF energy compared to controls.”

Page 154

On this gem of a page, amongst all the excuses for why even industry funded studies can't help but find an association between mobile phone use and brain cancer, this phrase has been extracted...

“When 20 types of tumors were considered separately however, an association was found between mobile phone use and one rare type of glioma, neuroepitheliomatous tumors”

This particular tumor is a deadly type of brain cancer with an almost zero survival rate.

“It should be noted that the average length of mobile phone exposure in this study was less than three years.

*Right above the glioma statement is the above admission of an only 3 year exposure to cell phone radiation in the study. The average latency for cancer is 30 years, some studies do detect brain tumors within 10 years as other studies on this issue have shown, since some people's latency is shorter than 30 years. But 3 years, you would be extremely hard pressed to find any association at all. **Despite this major handicap, an association was found with a cell phone use and a deadly type of glioma.***

The rest of page 154 in the Motorola manual tries to explain away the results of its own studies which were not supposed to find any increase in brain tumor with mobile

phone use, but did anyway, actually goes on to state that the studies they funded were incapable of being taken seriously because of all the design flaws in the studies (**even though they were responsible for those design flaws**). The manual then goes on to point out one of the more preposterous results and egregious design flaws in the industry funded studies by stating...

“In fact, the risk actually decreased with cumulative hours of mobile phone use.”

So out of all the design flaws and poor results, this is the one result that we are supposed to take seriously. In essence, the manual admits the industry studies showing “no effect” are deeply flawed, yet then goes on to sight one of the most egregious results of skewing of the science where these studies show a “protective effect” against brain tumors by using a cell phone. **Were these preposterous results to be real and accurate, they should be used as a promotional tool in their advertising campaigns and should be fully embraced rather than buried in tiny print in some manual on page 154.** Quoting this result in a manual laden with excuses for why we should not worry about cell phone radiation exposure and brain cancer according to the industry funded studies that show either “no effect” or a “protective effect” is dangerously misleading when dealing with the average consumer who is totally uneducated on the history of science, industry funded studies, protective skew and RF radiation-emitting devices.

More downplaying of results showing adverse health effects...

“None of these tests showed any effect of the RF except for the micronucleus assay, which detects structural effects on the genetic material. The cells in this assay showed changes after exposure to simulated cell phone radiation”

An attempt to explain away the above excerpt was also made, although eventually, at the end of the lengthy explanation as to how their own studies could find this result, they had to culminate with...

“The data already in the literature on the response of the micronucleus assay to RF are conflicting. Thus, follow-up research is necessary.”

It is very important to note that ALL of the studies mentioned in the Motorola manual are more than a decade old. Even the Lennart Hardell study is not his latest work which recently found in a study published in 2009, a 420% increase in brain cancer

*when the child begins using the cell phone before the age of 20 and with greater than one year of usage. **This finding had a greater than 99% confidence interval.***

*The manual goes on to say that the FDA will be condoning and encouraging more industry funded studies. **When industry funded studies show a clear bias towards their own product... why have them do any more research at all?** The FDA/FCC's condoning and support of more industry funded studies in the face of this evidence is a slap in the face to consumers, particularly since CTIA already funded a six year \$25,000,000 study in the 1990's which culminated in findings of micronuclei in blood, doubling of brain cancer and genetic damage to cells. We do not need more industry funded studies but **DO** need to take immediate actions to warn the public about the health hazard that stems from cell phone use.*

Page 155...

"When tumors did exist in certain locations, however, they were more likely to be on the side of the head where the mobile phone was used."

"Because this occurred in only a small number of cases, the increased likelihood was too small to be statistically significant."

What they are not telling you is the definition of statistical significance which is 95% or higher. In a court of law, the weight of the evidence is what matters, meaning 51% or higher. So if the study they are using shows a 93% confidence, it will be deemed "insignificant". Would you deem that insignificant to your health if the chances of a study being accurate were 93% or 94% as opposed to 95%? When dealing with human health, insignificant studies at 94.9% are allowed to be tossed by industry and regarded as insignificant. This is a blow to humanity, human health protection and should not be the bar by which we all live and die with product safety.

"In summary, we do not have enough information at this point to assure the public that there are, or are not, any low incident health problems associated with use of mobile phones."

Culminating on this page...

"What is known about cases of human cancer that have been reported in users of hand-held mobile phones?" ...

“Some people who have used mobile phones have been diagnosed with brain cancer.”

This information needs to be on the cover of the cell phone itself and the packaging.

Although this page along with page 156 goes on to state the low statistics of brain cancer in the US, it neither disclosed that many states do not even report brain tumor incidence and benign brain tumors which can also be deadly also go unreported, nor does it speak of the average 30 year latency time with cancer and that the brain tumors we may be seeing now from cell phone use are but the “canaries in the coal mine” on this issue. They are premature in terms of average latency, so we can expect numbers to grow as time passes, and until full latency time has been reached.

Continued on page 156

According to this manual, the FDA has urged the following of industry...

- support needed research into possible biological effects of RF of the type emitted by mobile phones
- design mobile phones in a way that minimizes any RF exposure to the user that is not necessary for device function
- cooperate in providing mobile phone users with the best possible information on what is known about possible effects of mobile phone use on human health

*Although this manual is an improvement as some of the issue of cell phones and deadly health effects are beginning to be brought to the consumer, the information in it is heavily biased and fails to include independent studies showing evidence of adverse biological and health effects at non-thermal levels from non-ionizing radiation. Thus, industry has already failed to live up to bullet point #3 in the above mandate from the FDA, **“providing mobile phone users with the best possible information on what is known about possible effects of mobile phone use on human health.”***

“In the absence of conclusive information about any possible risk, what can concerned individuals do?”

“If there is a risk from these products—and at this point we do not know that there is—it is probably very small.”

“The use of the word “small” is fast and loose and surely needs to be qualified...

- A) *Would "small" be 1 in 10 children?*
- B) *Would small be 1 in 100 adults?*
- C) *Qualification of the word small would be helpful to consumers in making their own choices about risk. If studies show a 420% increase with greater than one year of usage when the child begins using the cell phone before the age of 20, what would that look like with greater than 10 years of usage, or greater than 30 years of usage, the average latency time in which most brain cancers will begin to blossom? The careless and carefree attitude with the use of the word "small" begs for qualification as to what industry and our government agencies deem to be "small". Consumers need to be able to make an informed decision as to whether or not they too consider this risk to be "small". This glib and cavalier attitude to risk is callous, highly irresponsible and unconscionable, especially when children are being marketed to.*

"But if people are concerned about avoiding even potential risks, there are simple steps they can take to do so. For example, time is a key factor in how much exposure a person receives. Those persons who spend long periods of time on their hand-held mobile phones could **consider holding lengthy conversations on conventional phones** and reserving the hand-held models for shorter conversations or for situations when other types of phones are not available. **People who must conduct extended conversations in their cars every day could switch to a type of mobile phone that places more distance between their bodies and the source of the RF**, since the exposure level drops off dramatically with distance. For example, they could switch to: "

- a mobile phone in which the antenna is located outside the vehicle
- a hand-held phone with a built-in antenna connected to a different antenna mounted on the outside of the car or built into a separate package
- a headset with a remote antenna to a mobile phone carried at the waist

*In the above recommendations from page 157 of their manual, **Motorola makes NO MENTION of higher risk for lower age, such as with children and fetuses. We see this as NO ACCIDENT AND BELIEVE IT HAS PURPOSELY BEEN LEFT OUT OF THE MANUAL.***

“Where can I find additional information?”

“For additional information, see the following Web sites:

Federal Communications Commission (FCC) RF Safety Program

(select “Information on Human Exposure to RF Fields from Cellular and PCS Radio Transmitters”):

<http://www.fcc.gov/oet/rfsafety>

World Health Organization (WHO) International Commission on Non-Ionizing Radiation Protection (select Qs & As):

<http://www.who.int/emf>

United Kingdom, National Radiological Protection Board:

<http://www.nrpb.org.uk>

Cellular Telecommunications Industry Association (CTIA):

<http://www.wow-com.com>

U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health:

<http://www.fda.gov/cdrh/consumer/>”

*Page 158, Consumers are directed to industry websites, or websites whose health and safety advice is taken directly from industry associations. Would you trust Phillip Morris to advise the FDA on the health and safety of cigarettes? There is no difference here. NONE of these websites post studies or results from studies from independent studies from all over the world showing dangerous biological and health effects. For a list of websites which carry findings from independent studies, please download our **briefing book** and go to page 17...*

http://americanassociationforcellphonesafety.org/uploads/AMERICAN_ASSOCIATION_FOR_CELL_PHONE_SAFETY8.doc

*Federal government agency websites which are paid for by the citizens of the United States must be given a more balanced view of the current state of the science on this issue including listing peer reviewed, published and replicated studies, independent studies and their results showing adverse biological and health effects at non-thermal levels from non-ionizing radiation. Only industry funded results of studies are currently posted and discussed on these websites. Also, the verbal description of these studies are always written with industry slants skewing the verbiage towards nothing to worry about. Independent scientists must be allowed to contribute to these websites. **The government is supposed to be an impartial source of information. Citing only the industry point-of-view begs the question of which master our regulatory agencies serve.***

An excerpt from a statement issued by John Walls, Assoc. VP Public Affairs, CTIA in Washington, DC on PR Newswire, June 22 2010...

“According to the FCC, all such compliant phones are safe phones as measured by these standards.”

CTIA's careful choice of wording, “as measured by these standards” is by omission admitting “we know there are other standards by which the cell phone can be measured by, but all we have to do is abide by what the FCC has told us to abide by” and the CTIA is of course correct.

Since the cell phone's safety per FCC requirement is measured only in terms of thermal (heating) effects as opposed to non-thermal (non-heating) effects. The premise behind the careful wording John Wallis used is intended to relieve industry of legal liability against current and future brain cancer lawsuits, blaming “the FCC's inadequate safety standards of health” on why they have done nothing to protect the public from the harm their products are causing through non-thermal health effects.

EPA AND NIOSH CONCUR ON THE ISSUE OF NON-THERMAL EFFECT AND THAT SAR SAFETY STANDARDS ARE NOT PROTECTIVE OF HUMAN HEALTH. THE EUROPEAN ENVIRONMENTAL AGENCY RECOMMENDS WARNING LABELS ON CELL PHONES

EPA weighs in on non-thermal effects from non-ionizing radiation and our current “safety standards” as issued by the FCC.

The following are excerpts from a letter written by **Norbert Hankin, EPA, Center for Science and Risk Assessment** July 16, 2002 to Janet Newton of the EMR Policy Institute. We have bolded certain statements for easier viewing. You can download the full letter at...

http://www.americanassociationforcellphonesafety.org/uploads/noi_epa_response.pdf

“I believe that it is correct to say that **there is uncertainty about whether or not current guidelines adequately treat non thermal, prolonged exposures** (exposures that may continue on an intermittent basis for many years.)”

“The FCC’s current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing radiation Protection, are thermally based, and do not apply to chronic, non thermal exposure situations. They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn.

“The hazard level (for frequencies generally at greater than 3MHz) is based on a specific absorption dose-rate, SAR, associated with an effect that results from an increase in body temperature.”

“The FCC’s exposure guideline is considered protective of effects arising from a thermal mechanism but not from all possible mechanisms. Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified.”

“This SAR was observed in laboratory research involving acute exposures that elevated the body temperature of animals, including nonhuman primates.”

The exposure guidelines did not consider information that addresses non thermal, prolonged exposures, i.e., from research showing effects with implications for possible adversity in situations involving chronic/prolonged, low level (non thermal) exposures.”

“...there are certain reports that suggest that potentially adverse health effects such as cancer, may occur.”

“Since EPA’s comments were submitted to FCC in 1993, the number of studies reporting effects associated with both acute and chronic low-level exposure to RF radiation has increased.”

“...some contemporary guidelines state explicitly that their adverse-effect level is based on an increase in body temperature and **do not claim that the exposure limits protect against both thermal and non thermal effects. The FCC does not claim that their exposure guidelines provide protection for exposures to which the 4 W/kg SAR basis does not apply, i.e., exposures below the 4 W/kg threshold level that are **chronic/prolonged and non thermal.**”**

“...there is uncertainty about possible risks from non thermal, intermittent exposures that may continue for years.”

“In summary, the current exposure guidelines used by the FCC are based on the effects resulting from whole-body heating, not exposure of and effect on critical organs including the brain and eyes. In addition, the maximum permitted local SAR limit of 1.6 W/kg for critical organs of the body is related directly to the permitted whole body average SAR (0.08 W/kg), with no explanation given other than to limit heating.”

“Federal health and safety agencies have not yet developed policies concerning possible risk from long-term, non thermal exposures.”

“...incorporating information on exposures scenarios involving repeated short duration/non thermal exposures that may continue over very long periods of time (years), with an exposed population that includes children, the elderly, and people with appropriate protective exposure guidelines.”

The following are excerpts from a letter written on June 17, 1999, from Dept. Health and Human Services to IEEE, the industry association who helped create the current FCC guidelines. You can download a copy of the letter at...

http://www.americanassociationforcellphonesafety.org/uploads/Letter_NIOSH.pdf

From:

W. Gregory Lotz, Ph.D.
Chief, Physical Agents Effects Branch
Division of Biomedical and
Behavioral Science
Dept. Health and Human Services
National Institute for Occupational Safety and Health
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TO:

Mr. Richard Tell
Chair, IEEE SCC28 (SC4)
Risk Assessment Work Group
Richard Tell Associates, Inc.
8309 Garnet Canyon Lane
Las Vegas, NV 89129-4897

RF Guideline Issues

Identified by members of the federal RF Interagency Work Group, June 1999

Issue: Biological basis for local SAR limit

“...an effort should be made to base local SAR limits on the differential sensitivity of tissues...”

“For example, it seems intuitive that the local limits for the brain and bone marrow should be lower than those for muscle, fat and fascia; this is not the case with the current limits which implicitly assume that all tissues are equally sensitive (except for eye and testicle).”

“Since the adverse effect level for the 1991 guidelines was based on acute exposures, does the same approach apply for effects caused by chronic

exposure to RF radiation, including exposures having a range of carrier frequencies, modulation characteristics, peak intensities, exposure duration, etc., that does not elevate tissue temperature on a macroscopic scale? “

Selection criteria that could be considered in determining unacceptable/adverse effects include:

- a) adverse effects on bodily functions/systems
- b) minimal physiological consequences
- c) measurable physiological effects, but no known consequences

“There is a need to discuss and differentiate the criteria for guidelines for acute and chronic exposure conditions. The past approach of basing the exposure limits on acute effects data with an extrapolation to unlimited chronic exposure durations is problematic.”

“For lower level (“non-thermal”), chronic exposures, the effects of concern may be very different from those for acute exposure (e.g., epigenetic effects, tumor development, neurologic symptoms.”

“In either case (chronic effects data that are useful or not useful), a clear rationale needs to be developed to support the exposure guideline for chronic as well as acute exposure. “

...”Thus, a two-tier guideline offers more flexibility in dealing with scientific uncertainty, while a one-tier guideline would force a more conservative limit to cover all circumstances including the scientific uncertainties that exist.”

“On the other hand, if it is determined that certain populations (due to their health status or age) are more susceptible to RF exposures, then a multi-tiered standard, applicable only to those specific populations, may be considered. “

There is a need to provide a clear rationale for the use of uncertainty factors.

Issue: Intensity or frequency modulated (pulsed or frequency modulated) RF radiation

Studies continue to be published describing biological responses to non-thermal ELF-modulated and pulse-modulated RF radiation exposures that are not produced by CW (unmodulated) RF radiation. These studies have resulted in concern that exposure guidelines based on thermal effects, and using information and concepts (time-averaged dosimetry, uncertainty factors) that mask any differences between intensity-modulated RF radiation exposure and CW exposure, do not directly address public exposures, and therefore may not adequately protect the public. The parameter used to describe dose/dose rate

and used as the basis for exposure limits is time-averaged SAR; time-averaging erases the unique characteristics of an intensity-modulated RF radiation that may be responsible for producing an effect.

Documentation should be provided that the literature review process included a comprehensive review of the following three areas:

- 1) long-term, low-level exposure studies (because of their importance to environmental and chronic occupational RFR exposure);
- 2) neurological/behavioral effects (because of their importance in defining the adverse effect level in existing RFR guidelines); and
- 3) micronucleus assay studies (because of their relevance to carcinogenesis).

The European Environmental Agency

Executive Director of the European Environment Agency,
Professor Jacquie Glade
Copenhagen,
15 September, 2009.

Recommendations based on current evidence

The evidence is now strong enough, using the precautionary principle, to justify the following steps:

1. For governments, the mobile phone industry, and the public to take all reasonable measures to reduce exposures to EMF, especially to radio frequencies from mobile phones, and particularly the exposures **to children and young adults who seem to be most at risk from head tumours. Such measures would include stopping the use of a mobile phone by placing it next to the brain.** This can be achieved by the use of texting; hands free sets; and by the use of phones of an improved design which could generate less radiation and make it convenient to use hands free sets.
2. To reconsider the scientific basis for the present EMF exposure standards which have serious limitations such as reliance on the contested thermal effects paradigm; and simplistic assumptions about the complexities of radio frequency exposures.
3. **To provide effective labeling and warnings about potential risks for users of mobile phones.**

THE SWISS MAKE ENORMOUS HOLES IN THE CHEESE OF CELL PHONES, WIRELESS PRODUCTS AND INFRASTRUCTURE BEING SAFE:

WHY SWISS RE WILL NOT RE-INSURE MOBILE PHONES FOR HEALTH RISKS

A re-insurance company is a company that backs up an industry for claims that the industry may not be able to cover. Possibly the largest re-insurance company in the world, Swiss Re, will not take this liability on with cell phones and health effects. At present, most cell phone companies are "self insured". Meaning, they may be able to just file bankruptcy and wash their hands of it all should there be too many claims. There should be laws against such behavior...But there aren't.

The following are selections of statements from Swiss Re's paper on why it will not take on health claims from cell phones.

We have written our words in italics so as to decipher from Swiss Re's words.

Opening statement...

"Electro-smog is suspected of promoting cancer and other diseases. Prevailing opinion assumes, however, that the electrical engineering and power industries can only be held liable if science provides conclusive proof - which it has not done to present - that weak electromagnetic fields impair health"...

...“This publication come to the opposite conclusion and shows that on the basis of present knowledge, it must be expected that plaintiffs will win suits dealing with this issue.”

Swiss Re Table for risk...

The rating of 33 is the most dangerous and highest risk rating possible for re-insurance with Swiss Re. Were the table divided up into grades that we received in school, it would like something like this...

**1-6 is an A,
7-12 a B,
13-19 a C,
20-26 a D,
27-33 F**

Asbestos, endocrine disrupters, nano technology and fuel additives are considered to be more “insurable” than cell phones and EMF related products and infrastructure. On a totally separate note, beef is almost as uninsurable as cell phones since the US prohibits testing of it’s cattle for mad cow disease.

Softeners (endocrine disrupting chemicals (EDC) 20.0

Asbestos (re-emerging risk) 21.0

Resistance to antibiotics 21.5

Methyl Tertiary-Butyl Ether (MTBE additives to fuel) 22.0

Nano Technology 23.0

Genetical Modified Crops 24.0

Unintentional/accidental mixing and blending of GM crops 24.0

Animals or animal products and feedstuffs infected with Bovine Spongiform Encephalopathy (Mad Cow Disease) 26.5

Electromagnetic Fields (EMF), Electro-smog 27.0

Electromagnetic fields received the highest risk rating on the entire list, above agents that are known carcinogens and known killers like meat infected with mad cow disease.

Page 11

“Energy effects harm organisms when individual molecules, cells or organisms absorb so much energy that they are totally or partially destroyed.”...

...”One possible consequence is the formation of cancer cells.

Page 12

“Signal effects, on the other hand, can be brought about by even the weakest fields because, as was illustrated in an example of the terrified cinema-goer, an organism can convert weak signals into powerful biological responses - much as a radio receiver amplifies the weak signals emitted by a transmitter.”

“Working on the generator principle outlined above, an **external alternating magnetic field can induce electrical currents in the body, which under certain circumstances can lead to heart flutter, provoke visual disturbances and affect biochemical processes.**”

“Nonetheless, harm to the organism is conceivable.”...

...”This corresponds to the hypothesis of electrosmog: some researchers conjecture that the profusion of electromagnetic phenomena in environments with high densities of electrical devices produce a kind of smog which over the long term, stresses organisms in a manner similar, for example, to low volume, but continuous noise.

“Secondly it is conceivable that the regulatory mechanism itself could be impaired. One example of such thinking is the melatonin hypothesis. Melatonin is an important hormone which is thought to have a cancer-suppressing effect. It is produced by the pineal gland, which is located deep in the brain...”

“Experiments show that magnetic fields also act on the pineal gland, leading to a decrease in melatonin production. The fields do not damage the gland, but send it a signal not to produce melatonin at the present time. This is why we cannot exclude the possibility that magnetic fields of technical origin may influence the pineal gland, cause a reduction in melatonin production and thus indirectly weaken an organism’s defenses against tumours.”...

...”In principle, therefor, we are dealing with damage which as a rule can be attributed just as unambiguously to certain types of electromagnetic exposure as a broken bone can be attributed to a fall while skiing.”

“To return to our earlier example, reduced melatonin production may be attributable not only to the effects of magnetic fields, but to many different, possibly even unknown processes.”

“On the other hand, research deals with complex cause-and-effect interrelationships, in which observable biological responses can be triggered or influenced in unknown ways by weak signals.”

“Should we someday know what role weak electromagnetic fields play in cancer, then it will only be because we will also know what causes cancer.”

“For example, several studies show that children growing up in the vicinity of high-voltage power lines develop leukemia more frequently than the norm. However, to see this as proof or even clear evidence that electromagnetic fields have a carcinogenic or cancer-promoting effect is to draw a conclusion that contradicts all the rules of statistics and is scientifically untenable. This is because these studies note only the correlation between the presence of certain sources of EMF - the electrical lines - and the relative incidence of this disease among children were effectively exposed, nor were they able to determine whether signs of irritation actually occurred. Moreover statistical studies

never conclude anything about the type of relationships which may exist between two phenomenon.”

Page 15

“Since the signals are amplified by the organism, however, it is theoretically possible for even the weakest signals to induce biological responses and in this way affect organic processes. This yields the hypothetical possibility of indirect relationships between weak electromagnetic exposure and, in the final analysis, every complex process taking place in the organism, including such diseases as cancer, Alzheimer’s, Parkinson’s and so forth.”

Page 18

“For liability insurers, risk derives from something quite different: namely, whether hypothetical relationships between weak electromagnetic fields and various diseases will be considered **causal** in nature.”

Page 19

“Thus far, we have discussed the hazards posed by electromagnetic phenomena. In doing so, we have considered the health of those who are exposed to such radiation and fields as possibly endangered.”

Page 21

“Modern science no longer attempts to explain why a particular thing must necessarily occur, but instead studies the conditions under which it can occur. Instead of thinking in the yes/no category, modern science thinks in probabilities.”

Page 22

“While classical science considered a cause to be only that which must necessarily bring about an effect as a result of the causal principle, today a cause is also considered to be that which may bring about an effect.”

“Yet, in that case, .97 must also be causal, and so forth, until finally a cause must be considered to be even that which brings about the effect with a probability of .01.’

‘In conclusion, we may state that a particular thing which leads to an effect in 99.99% of all cases is to be designated as a cause in the same way as a thing which brings about an effect in only .01% of all cases.’

Page 24

“As soon as it can be demonstrated that one of these factors discernibly increases the probability of the effect, however, we refer to it as a cause. The decisive criterion for causality is therefore only that a thing discernibly increases the probability that an effect will occur.”

“In this case it would be sufficient to prove that weak fields can increase the probability of disease. And it is precisely this which cannot be excluded: the possibility that electromagnetic exposure might favor the incidence of certain diseases. In that case - according to our present understanding - electromagnetic fields would be a cause of disease just like flu virus which may, but need not necessarily, result in influenza.”

“In an ever increasing number of apparently coincidental relationships, science is now discovering statistical laws which are like-wise being described as causal in nature.”

Page 25

“At present, the EMF liability risk is no longer calculable. In contrast to the health risks posed by EMF, however, this risk is not incalculably small, but in views of the conceivable extent of damage, incalculably great.”

Page 26

“Analogous to the distinction between EMF risks and EMF liability risks, we will first consider the risks to health insurers. For them, the risk of change would consist in the possibility of abruptly rising health-care costs in connection with EMF.”

“Therefore, the risk of change must be understood as the possibility that the routine use of electrical devices and installations for their intended purposes, and in accordance with the state of the art - all of which has long been considered harmless - could suddenly be deemed hazardous to health...”

“This could happen for two reasons; first, new scientific findings might provide objective proof that EM health risks are significantly greater than has been assumed thus far.”

Page 28

“EMF research has already found out too much to be able to ignore the health risks, yet has not found out enough to gauge them.”

Page 30

“What is required, therefor, is a general consensus on how much risk individuals may reasonably be expected to accept: or in plain terms, What maximum number of people are we willing to accept who may suffer harm within a given period as a consequence of the practical application of a certain technology?”

Two consequences can be drawn from this: First, every citizen should be prepared to bear part of the collective burden of risk. Secondly, society must show its solidarity with victims by helping them to deal at least with the financial loss involved.

SWISSCOM SPEAKS OUT...But what about the industry stance of no health effects and **non-thermal** is meaningless and scientifically unproven? Evidently the song changes when financial gain is in play...

EVIDENCE OF INDUSTRY ADMISSION OF GENETIC DAMAGE, CANCER AND ADMISSION OF NON-THERMAL EFFECTS FROM CELL PHONE, CELL TOWER RADIATION AND OTHER WIRELESS PRODUCTS AND INFRASTRUCTURE.

<http://www.americanassociationforcellphonesafety.org/uploads/swiss-com.pdf>

In 2004, the wireless telecom company, Swisscom, went public (but in private within a patent office) about the genetically damaging **non-thermal** (the very property of wireless transmissions that industry denies having any effects on health) and cancer causing effects of electrosmog...that is second and first hand radiation produced by cell phones, cell towers and other wireless products and infrastructure. Now why on earth would they ever admit to such knowledge after so much heavy denial?...Because they wanted to make money off a patent idea they had to reduce electrosmog of course. This type of behavior, knowingly admitting there to be dire health consequences with a product, and then continuing selling that product or propagating it onto the public without voluntary consent, while still publicly denying that they know, about these health effects, should not only be a criminal offense by the company who behaves this way, but also the government agencies who allow it to happen and profit from it should be held accountable. There MUST be laws against this behavior. It is outrageous that it continues to this day and still not only is no one held accountable, but industry is still not even fully disclosing to citizens the potentially deadly and genetically damaging health effects associated with their products!! In fact they are still denying that these non-thermal effects even exist!!

INCREDIBLE LANGUAGE FROM SWISSCOM PATENT APPLICATION...

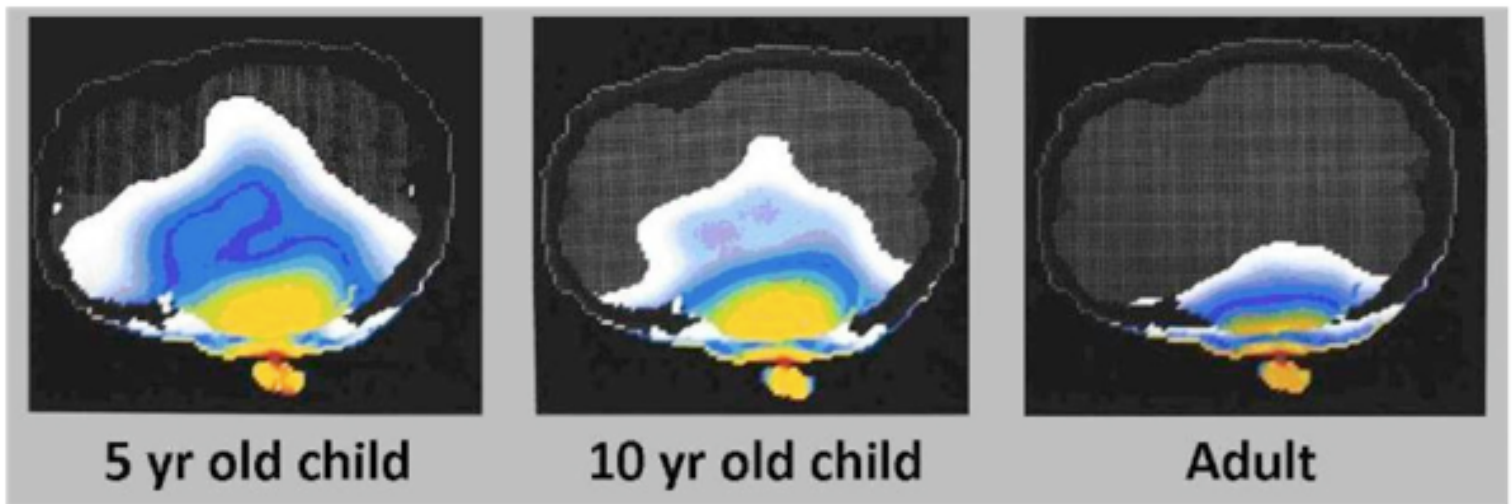
"The influence of electrosmog on the human body is a known problem."...

..."When for example, human blood cells are irradiated with electromagnetic fields, clear damage to hereditary material has been demonstrated and there have been

indications of an increased cancer risk (Mashevicj M., Folkman D., Kesar A., Barbul A., Korenstein R., Jerby E., Avivi L., Department of Human Genetics and Molecular Medicine, Tel-Aviv University, Tel-Aviv, Israel, "Exposure to human peripheral blood lymphocytes to electromagnetic fields associated with cellular phones leads to chromosomal instability," Bioelectromagnetics, 2003 Feb., 24(2): 82-90). In this study, for example, human peripheral lymphocytes were exposed to continuous electromagnetic fields of 830 MHz in order to examine whether this leads to losses or gains in chromosomes (aneuploidy). Bigger changes lead to instability of the genome (= the totality of all genes of a germinal cell) and thereby to cancer. The human peripheral blood lymphocytes (PBL) were irradiated at different average specific absorption rates (SAR) of 1.6 to 8.8 W/kg over a time period of 72 hours in an exposure system based on a parallel plate resonator in a temperature range of 34.5 to 37.5 degrees Celsius. The average absorption rate (SAR) and its distribution in the exposed tissue culture flask were determined by combining the measurement results with a numerical analysis based on a finite element simulation code. A linear increase in the chromosome No. 17 – an aneuploidy (=numerical chromosome aberration) – was observed as a function of the SAR, demonstrating that this radiation has a genotoxic effect. The SAR-dependent aneuploidy was accompanied by an abnormal mode of replication of the chromosome 17 region engaged in segregation (repetitive DNA arrays associated with the centromere), suggesting that epigenetic alterations are involved in the SAR dependent genetic toxicity. Control experiments (i.e. without any radio frequency radiation) carried out in the temperature is not associated with either the genetic or epigenetic alterations observed following RF radiation, these alterations being the increased levels of aneuploidy and the modification in replication of the centromeric DNA arrays. These findings indicate that the genotoxic effect of electromagnetic radiation is elicited via a non-thermal pathway. Moreover aneuploidy is to be considered as a known phenomenon in the increase in cancer risk.

Thus it has been possible to show that mobile radio radiation can cause damage to genetic material, in particular in human white blood cells, whereby both the DNA itself is damaged and the number of chromosomes changed. This mutation can consequently lead to increased cancer risk. In particular, it could also be shown that this destruction is not dependent upon temperature increases, i.e. is **non-thermal**. Based on the scientific studies in the field, and owing to increasing pressure from the public, especially in the industrialized countries, epidemiological studies have been systemized by the World Health Organization (WHO) in the last few years, such as e.g. the currently running WHO Interphone Project, in order to be able to assess more precisely the health risks from electrosmog and work out corresponding guidelines.

WARNING LABELS



Above picture from Om Gandhi study on children's brain's absorption compared with adult's brains. Children's brains absorb 230% more radiation than those of adults due to their thinner skulls. Fetuses are even more vulnerable.

In Dec. 2010, the state of Oregon filed THE CHILDREN'S WIRELESS PROTECTION ACT, Oregon's adaptation of this bill is the first in the world to make use of critically important words, non-thermal. By putting **non-thermal** on the table, we address the fact that the current safety standards do not incorporate *any* **non-thermal** effects at all, the very effects that are causing all the problems with cell phones.

Here is the very mild but vitally important language Oregon legislative council selected...Reasoning behind some of this language is that there be no legal argument with any of it...

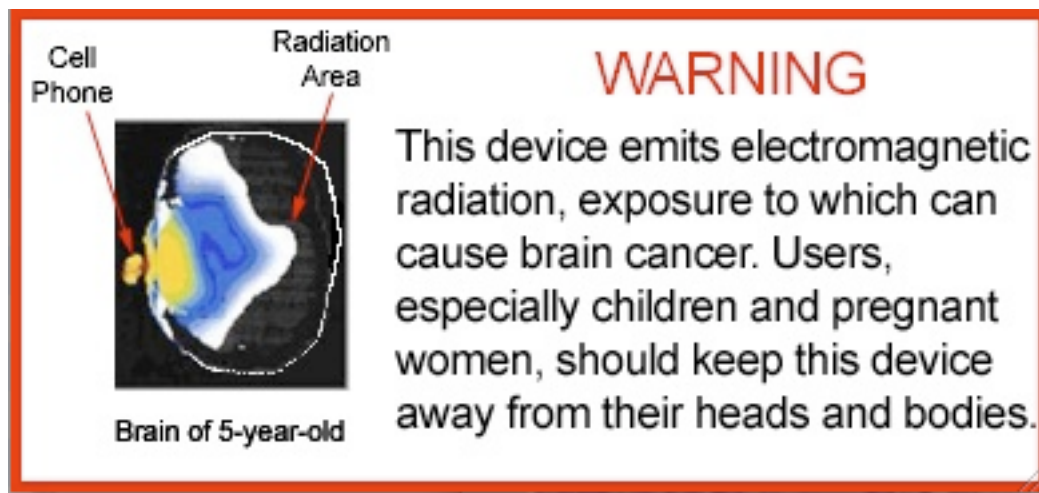
WARNING, This is a radio frequency (RF) radiation-emitting device that has non-thermal biological effects for which no safety guidelines have yet been established. Controversy exists as to whether these effects are harmful to humans. Exposure to RF radiation may be reduced by limiting your use of this device and keeping it away from the head and body.

Why this language? There can be no argument that **non-thermal** effects have been ignored and there are **no** safety guidelines in existence for them. There can be no argument that there is *controversy* over the effects of **non-thermal** properties of the transmissions, with industry funded studies saying one thing, independently funded studies saying another thing entirely and there is no argument that limiting use of these radiation-emitting devices or keeping them away from the head and body reduces exposure to **non-thermal** effects and therefore health effects.

Our current safety standards do not address *any* non-thermal effects...as if they didn't even exist. The above warning label will raise the much needed awareness to them.

In March of 2010, THE CHILDREN'S WIRELESS PROTECTION ACT, the first health warning label bill in the world calling for brain cancer warning labels on cell phones for children and pregnant women was adapted for and introduced in the state of Maine. Here is the language of the label...

WARNING, This device emits electromagnetic radiation, exposure to which can cause brain cancer. Users, especially children and pregnant women should keep away from the head and body.



Why the above language? Currently, cell phones are tested on a 220 lb. male model of a plastic head with a plastic spacer almost one inch long between the ear and the radiation-emitting model being used (almost never is an actual cell phone used in the testing). Children's brains absorb 230% more radiation because their heads are smaller and their skulls are thinner. Fetuses are even more vulnerable. And of course, many independently funded studies and even industry funded studies show brain cancer is a by-product of cell phone use and that children have an enormous increase in the likelihood of developing

tumors (See page 73). We feel this warrants notification to parents who are wanting to protect their children rather than place them in harms way. Isn't that why they bought their child a cell phone in the first place? Most of this language is now in the Motorola manuals anyway. Why not start putting them up front and center, where people will actually see them instead of being buried on pages 152 - 160?

In Canada, the Province of Ontario also recently introduced this language...

WARNING, This device emits electromagnetic radiation. Long term exposure may cause cancer. Users, especially children, should keep this device away from the head and body.

Here is the language and label that was recommended to many of our federal legislators when we met with them this year...



“WARNING, this radiation emitting device has not been pre-market tested for safety. Users, especially children and pregnant women should keep away from the head and body.”

Here are a couple of other good choices...

WARNING, There is an established controversy over the question of safety of this radiation emitting device which has not been proven safe for non-thermal effects. The manufacturer recommends keeping this product away from the head and body, reproductive organs and pregnancies.

WARNING, This is a radiation emitting device which has not been tested for the safety of women and children. The manufacturer recommends pregnant women keep this product away from their fetuses and children keep away from reproductive organs. The manufacturer also states that some people who have used mobile phones have been diagnosed with brain cancer.

The following warning label language has either been taken DIRECTLY out of the Motorola phone manuals or DIRECTLY from the FCC website. The point is to get something going that will pass muster legally. Taking words directly from their own manuals or directly from the FCC website would create a PR circus should they try and sue against utilizing their own language. We also want to ensure their loss.

WARNING, This is a radiation emitting device which has not been tested for the safety of women and children. The manufacturer recommends pregnant women keep this product away from their fetuses and children keep away from reproductive organs. The manufacturer also states that some people who have used mobile phones have been diagnosed with brain cancer.

WARNING, There is no federally developed national standard for safe levels of exposure to radio frequency (RF) energy. The manufacturer of this product recommends pregnant women keep away from their abdomen, children keep away from their reproductive organs and for users to keep the phone at least one inch from the head and body at all times.

WARNING, The manufacturer of this product recommends pregnant women keep away from their fetuses and children keep away from their reproductive organs and to keep the phone at least one inch from the head and body at all times.

WARNING, The SAR value used for FCC approval does not account for the multitude of measurements taken during the testing. There is no federally developed national standard for safe levels of exposure to radio frequency (RF) energy. The manufacturer of this product claims users have been diagnosed with brain cancer. Further, ipsilateral (same side of head) brain cancer is associated with this product.

WARNING, Studies on this radiation-emitting device show structural effects on genetic material. The manufacturer of this product recommends pregnant women keep away from their fetuses and children keep away from their lower abdomen and to keep the phone at least one inch from the head and body at all times.

WARNING, The long-term characteristics or the possible physiological effects of Radio Frequency Electromagnetic fields have not been evaluated by Underwriters Laboratories Inc. (UL). Studies on this radiation-emitting device show structural effects on genetic material. The manufacturer of this product recommends pregnant women keep away from their fetuses and children keep away from their lower abdomen and to keep the phone at least one inch from the head and body at all times.

WARNING, Some people who have used mobile phones have been diagnosed with brain cancer. Studies on this product also show damage to genetic material. The manufacturer of this product recommends pregnant women keep away from their fetuses and children keep away from their lower abdomen and to keep the phone at least one inch from the head and body at all times.

THE SCIENCE OF NON-THERMAL EFFECTS IN LAYMAN'S LANGUAGE

Table of ten studies showing effects below SAR safety standards of 1.6 W/kg.

The following table of 10 studies all show biological and health effects under 1.6 W/kg, our current SAR safety standards. This first study is literally *thousands* of times below SAR safety standards. Two of the below studies also include findings below 2 W/kg, the European standard for heat related effects. This table is reason enough for warning labels on cell phones as well as re-defining safety standards of **all** wireless radiation-emitting devices which are also based on the same non-sensical, industry friendly, public health adverse, standards of heat only.

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|---------------------------------------|--|--|--|---|
| 0.00012, 0.0012, 0.012, or 0.12 W/kg. | Neuronal damage in the brains of rats at very low SAR levels | Dementia, ALS Parkinson's disease, other neurological diseases | Rats were either exposed to microwaves or sham exposed for 2 h at SARs of 0.00012, 0.0012, 0.012, or 0.12 W/kg . The rats were sacrificed after a recovery time of either 14 or 28 days. The occurrence of dark neurons (dead brain cells) in the rat brains was significantly enhanced after 28 d (p = 0.02) . Furthermore, in the 28-d brain samples, neuronal albumin uptake was significantly correlated to occurrence of damaged neurons (Spearman $r = 0.41$; $p < 0.01$). | Eberhardt J et al , (2008) <i>Blood-brain barrier permeability and nerve cell damage in rat brain 14 and 28 days after exposure to microwaves from GSM mobile phones</i> , Electromagn Biol Med 2008;27(3):215-29 http://www.ncbi.nlm.nih.gov/pubmed/18821198 |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|--------------------------------------|--|---|---|
| 0.6 W/kg | Decrease in Memory Performance | Dementia | The results showed retarded learning while performing in the radial-arm maze to obtain food rewards, indicating a deficit in spatial "working memory" function. We believe that neurotransmitter systems in the brain are involved in the microwave-induced reduced memory performance. | Lai H et al, 1994 Microwave irradiation affects radial-arm maze performance in the rat, Bioelectromagnetics 1994;15(2):95-104 http://www.ncbi.nlm.nih.gov/pubmed/8024608 |
| 1.2 W/kg | Single and double strand DNA breaks. | Malignant and benign brain tumors, acoustic neuroma. | DNA breaks were found in individual brain cells were measured at 4h post-exposure at an exposure level of Exposure SAR of 1.2 W/kg to 2450 MHz pulsed RF. An increase in both types of DNA strand breaks was observed after exposure to either the pulsed or continuous-wave radiation. These effects could result from a direct effect of RF energy on DNA molecules and/or impairment of DNA-damage repair mechanisms in brain cells. | <i>Lai H, Singh N. (1996) Single- and double-strand DNA breaks in rat brain cells after acute exposure radiofrequency electromagnetic radiation.</i> Int J Radiat Biol 69(4):513-21 http://www.ncbi.nlm.nih.gov/pubmed/8627134 |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|--|--|---|---|
| 1.2 W/kg | Decrease in memory performance | Dementia | The rats were exposed to pulsed 2450 MHz microwaves at a SAR of 1.2 W/kg for 6 hours in total over a week. The results show that exposure to pulsed microwaves caused a deficit in spatial "reference" memory in the rat. | Wang B, Lai H , (2000) <i>Acute exposure to pulsed 2450-MHz microwaves affects water-maze performance of rats</i> , Bioelectromagnetics 2000 Jan;21(1):52-6 http://www.ncbi.nlm.nih.gov/pubmed/10615092 |
| 1.2 W/kg or 2 W/kg | Effect: DNA single- and double-strand breaks | Malignant and benign brain tumors, acoustic neuroma. | RF-EMF exposure (1800 MHz; SAR 1.2 or 2 W/kg ; different modulations; during 4, 16 and 24h; intermittent 5 min on/10 min off or continuous wave) induced single- and double DNA strand breaks. Effects occurred after 16 h exposure in both cell types and after different mobile-phone modulations. The intermittent exposure showed a stronger effect than continuous exposure. We conclude that the induced DNA damage cannot be based on thermal effects. | Diem E et al , (2005) <i>Non-thermal DNA breakage by mobile-phone radiation (1800 MHz) in human fibroblasts and in transformed GFSH-R17 rat granulosa cells in vitro.</i> , Mutat Res 583(2): 178-83 http://www.ncbi.nlm.nih.gov/pubmed/15869902 |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|-----------------------|---|---|---|
| 0.12 W/kg | Decreased cell growth | Impairment of normal DNA repair, immune system malfunction, birth defects | Prepared cell samples were exposed to a 935 MHz continuous wave frequency field for 1, 2, and 3 h. The structure of microtubule proteins has been determined using the immunocytochemical method. In comparison with control cells, the microtubule structure clearly altered after 3h of irradiation (p <0.05). Significantly decreased growth was noted in cells exposed for 3h three days after irradiation (p <0.05). We found that 935 MHz radiation similar to that from a cellphone affects microtubule proteins which consequently may obstruct cell growth. | Pavacic I et al, (2010) <i>In vitro testing of cellular response to ultra high frequency electromagnetic field radiation</i> , Toxicol In Vitro 2008 Aug;22(5): 1344-8 http://www.ncbi.nlm.nih.gov/pubmed/18513921 |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|--|---|---|--|
| 1.4 W/kg | Decreased spatial memory performance in humans | Early Dementia | <p>This study investigated the effects of a 2.5h RF exposure at 884 MHz on spatial memory and learning, using a double-blind repeated measures design. The exposure was designed to mimic that experienced during a real-life mobile phone conversation. The average exposure was a peak SAR (10g) of 1.4 W/kg. The participants were daily mobile phone users, with and without symptoms attributed to regular mobile phone use. Results revealed a significant adverse effect of RF exposure on spatial memory.</p> | <p>Wiholm C et al, (2008) <i>Mobile phone exposure and spatial memory</i>, Bioelectromagnetics 2008 Sep 15. http://www.ncbi.nlm.nih.gov/pubmed/18792947</p> |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|---|--|--|--|
| .016 W/kg to 2 W/kg | Reduced brain cells in rats exposed to cellphone radiation at an early age. | Learning problems, ADD/ADHD, early dementia, Parkinson's, ALS and other Neurological illnesses | <p>The study investigated pyramidal cells of the 16-week -old female rat hippocampus following postnatal exposure to RF at 900 MHz (1 h/day for 28 days). The SAR varied between 0.016 W/kg (whole body) and 2 W/kg (locally in the head). All of the rats were sacrificed at the end of the experiment and the number of pyramidal cells was estimated.</p> <p>Histopathological evaluations were made on sections of the CA region of the hippocampus. Results showed that postnatal EMF exposure caused a significant decrease of the pyramidal cell number in the CA of the EMF group ($P<0.05$). Additionally, cell loss can be seen in the CA region of EMF group even on a visual observation. This could relate to the chronic effects of 900 MHz cellphone radiation on teenagers' brains.</p> | <p>Bas O et al, (2009) <i>900 MHz electromagnetic field exposure affects qualitative and quantitative features of hippocampal pyramidal cells in the adult female rat</i>, Brain Res 2009 Apr 10; 1265:178-85 http://www.ncbi.nlm.nih.gov/pubmed/19230827</p> |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|----------------------------------|---|---|--|
| .7 W/kg | Adverse effect on brain function | Learning problems, ADD/ ADHD, early Alzheimers, Parkinson's disease, other Neurological illnesses | The rats were exposed to ELF-MW (915 MHz, 20-ms pulse duration, approximately 0.3 mW/cm ² , 4 Hz) intermittently (1-min 'On', 1-min 'Off') for 10 min at a SAR about 0.7 W/kg several times per day. A cumulative phenomenon under repeated exposures to ELF-MW was revealed. These results are in line with evidence that repeated low-level exposure to pulse modulated microwaves similar to cellphone radiation adversely affects brain functioning. | Vorobyov V et al, (2010) <i>Repeated exposure to low-level extremely low frequency-modulated microwaves affects cortex-hypothalamus interplay in freely moving rats: EEG study</i> , Int J Radiat Biol 2010 May;86(5):376-83 http://www.ncbi.nlm.nih.gov/pubmed/20397842 |

| Level of SAR Below Current Standards | Effect | Long Term Illness associated with this effect | Author's description of results of study | Author, Title of Study, Citation and Pub Med link |
|--------------------------------------|---|--|---|---|
| .95 W/kg | A significant decrease in Purkinje cells in the brain that could affect brain function | early dementia, ALS Parkinson's, and other neurological diseases | Pregnant mice were exposed to GSM mobile phone radiation at 890-915 MHz at 0.95 W/kg SAR to investigate the effect on Purkinje cells. In humans, Purkinje cells are affected in a variety of diseases ranging from toxic exposure (alcohol, lithium), to autoimmune diseases and to genetic mutations (including ataxias and autism) and neurodegenerative diseases that are not thought to have a known genetic basis. Result: A significant decrease in the number of Purkinje cells and a tendency for granule cells to increase in cerebellum was observed. This could adversely affect brain function. | Ragbetli M <i>et al</i> , (2010) <i>The effect of mobile phone on the number of Purkinje cells: a stereological study</i> , Int J Radiat Biol 2010 Jul;86(7):548-54 http://www.ncbi.nlm.nih.gov/pubmed/20545571 |

For a list of **120 studies** showing reason for warning labels on cell phones and a re-defining of safety standards with wireless radiation-emitting devices, please go to <http://www.thepeoplesinitiative.org/uploads/Non-Thermal-List-of-Papers-Cellphone-related-papers-5.pdf>

Below is a simple breakdown of some of the non-thermal health effects from cell phones which are not accounted for in our current SAR safety standards.

It is important to note that some people actually FEEL these effects, while others either may not feel these effects or may not be aware of the cause of their symptoms. This can explain why some people are electro-sensitive (**people who are sensitive to electro-magnetic radiation, or the kind of radiation emitted from cell phones, cell towers, WIFI, etc., and contract ill health because of it**) and cannot put a cell phone near their head because of the pain or even be in the vicinity of wireless products. Some people never feel anything but eventually have a stroke, a brain tumor or other type of illness. Regardless of being able to feel them or not, these effects are happening to our cells when exposed to non-thermal levels of non-ionizing radiation.

At present, the only property of cell phone/wireless radiation that is regulated or even acknowledged as existing by the FCC are thermal levels of radiation is heat based and measured in SAR.

Other harmful properties of non-ionizing radiation that are totally ignored by our government regulatory agencies, totally unaccounted for in our current SAR safety standards, cause health effects at non-thermal levels and what we will focus on in this paper are...

FREQUENCY – How rapidly a signal vibrates or oscillates.

MODULATION – How the signal is varied, either by pulsing, changing the frequencies or changing the strength, shape or way the signal is delivered. There are many forms of modulation that are constantly evolving with the technology. We will be studying a few of the most common forms of modulation in this paper.

Some variations on these are...

FREQUENCY MODULATION - Changing the frequency of oscillation of the energy in the wave or changing the frequencies by super imposing them on the carrier (main) wave.

AMPLITUDE MODULATION – Changing or modulating the strength of signal by adding or subtracting power.

PULSE MODULATION – Changing the wave by pulsing it in order to control the way the information is delivered.

PHASE MODULATION – Abruptly changing the shape of the wave from smooth to jagged and splitting the wave up into potentially hundreds of different frequencies.

POWER DENSITY – How much power is behind the signal by when it reaches you. So if you are further away from source of the signal the signal, you will have less power density and vice versa.

The above properties of non-ionizing radiation have been associated with very serious illness, all at non-thermal levels.

All of the above non-thermal properties of non-ionizing radiation are totally unaccounted for in our current SAR safety standards.

The following studies have been selected because their findings have all been peer reviewed, published, replicated and have 95% confidence. 95% or higher is the scientific standard that the findings are “significant” and not by chance or mistake.

We have broken the scientific language down into layman’s language so that we all can understand the serious health implications of the results. The laymen’s definitions appear throughout in the abstract (**scientist’s summary of the study**), in real time, in parenthesis and bold for easier viewing, right next to the word, phrase, symbol or equation which may be too scientific or complex for the average layman or legislator to fully understand. We also summarize strictly in layman’s language, above each abstract, what the study means, what the non-thermal effect was and what the health implications are.

We have selected samples from three main types of scientific research on this issue;

In vivo studies (live animals),

In vitro studies (cells in a test tube)

Epidemiological studies (research on human populations).

The effects (although there are many more) from **non-thermal** levels of non-ionizing radiation in these studies are;

- 1) BBB (blood brain barrier leakage** (more on this later)
- 2) Brain cell damage and dead neurons** (more on this later)
- 3) Calcium efflux** (more on this later)
- 4) Heart arrhythmia and heart stoppage**
- 5) Malignant and benign brain tumors**

- 6) Sperm cell damage and death**
- 7) Stunted growth and mortality (death)**
- 8) Birth defects and infertility**
- 9) Funding bias in studies on this issue. (There is also an “effect” that industry funded studies have on non-ionizing radiation at non-thermal levels.)**

The bottom line is that biological and health effects from non-thermal, non-ionizing radiation emissions exist from cell phones and wireless PDA's and the public is *totally* unprotected from them.

POWER DENSITY

We have selected two studies showing obvious **health effects at extremely low, non-thermal** power densities.

In one study the effect **increased** with **decreasing or lowering the power density**, the opposite of what one might intuitively expect. In the other study the effect increased with **increasing** power density, what one *would* intuitively expect. **Thus, less power density does not necessarily mean safer or more protection when it comes to non-thermal biological and health effects.**

These studies were conducted at levels hundreds or thousands of times *below* current SAR safety standards.

These findings are in direct opposition to the myth that we are safer with a lower SAR phone.

These findings have been peer reviewed, published and replicated over the past few decades.

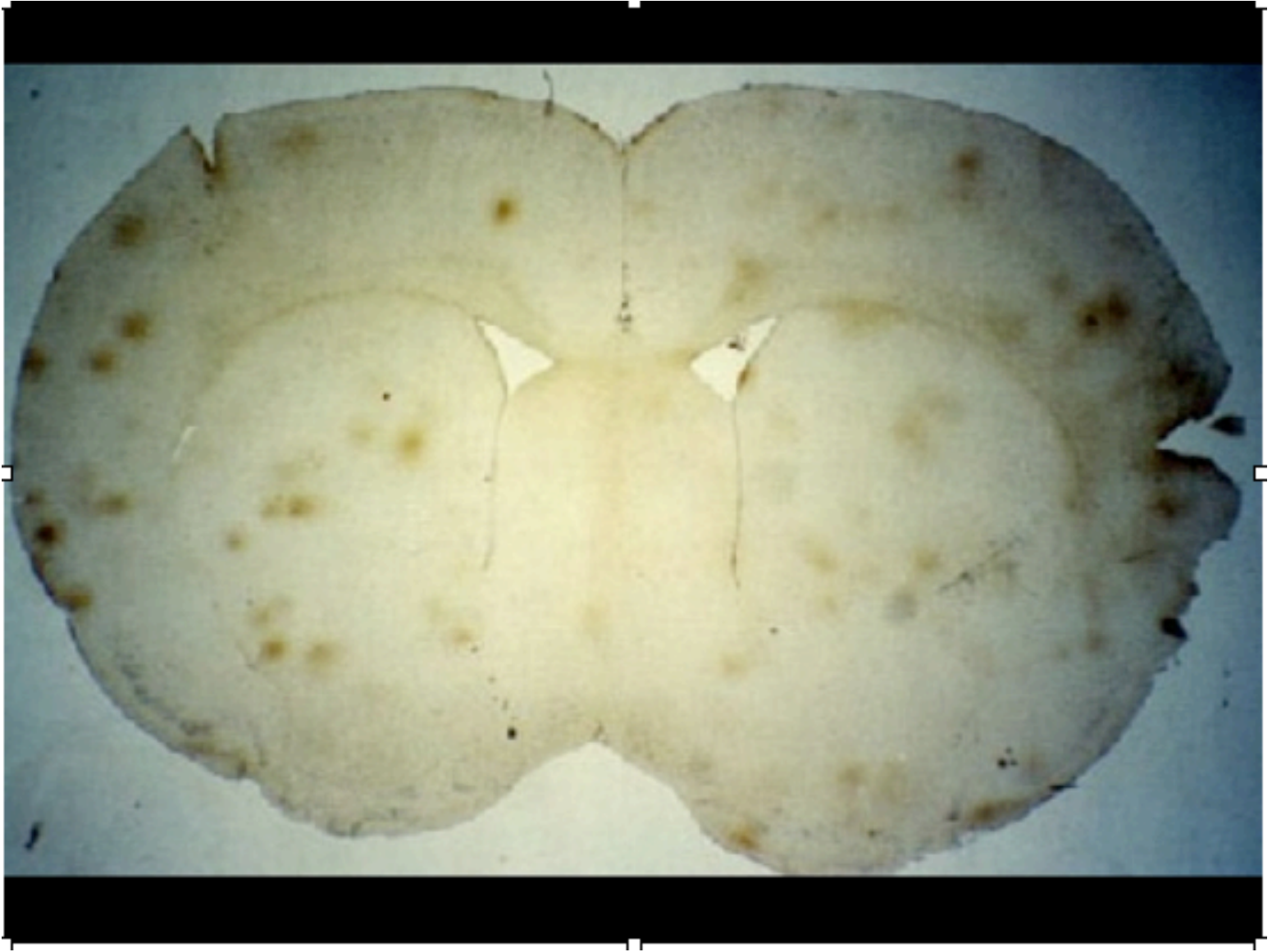
In Vivo (live animal) Studies...

1) Blood Brain Barrier leakage



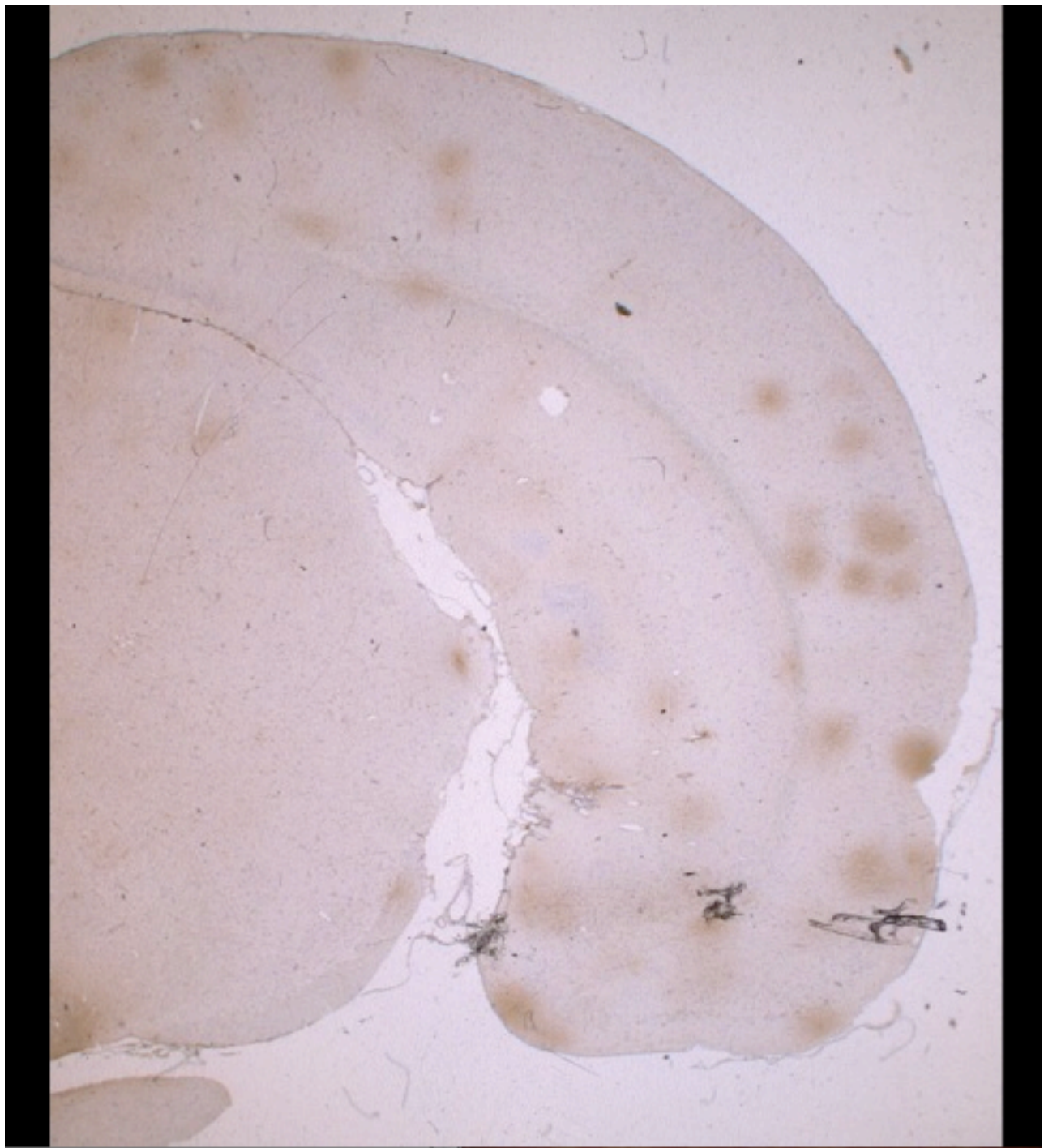
The above picture from a presentation by Dr. Leif Salford, Professor and Chairman of the Department of Neurosurgery, University Lund, Sweden

Normal rat brain.



The above picture from a presentation by Dr. Leif Salford, Professor and Chairman of the Department of Neurosurgery, University Lund, Sweden

Rat brain with dark spots showing albumin leakage after only two hours of exposure to cell phone radiation and examined fifty days after exposure.



The above picture from a presentation by Dr. Leif Salford, Professor and Chairman of the Department of Neurosurgery, University Lund, Sweden

More rat brain showing albumin leakage after two hour cell phone radiation exposure.

Lower power density = higher BBB (blood brain barrier) permeation and albumin leakage

BLOOD BRAIN BARRIER LEAKAGE CAUSED BY NON-IONIZING, NON-THERMAL, CELL PHONE RADIATION EXPOSURE.

The brain may be the most delicate and vulnerable organ in the body. It also lacks the ability to repair itself as easily, if at all, when compared with other organs such as liver, skin, bone, lungs, etc. It must be very carefully protected. Nature has taken care of this problem for us by creating the BBB (blood brain barrier) which are tiny blood capillaries (**small blood vessels**) in the brain, surrounded by tightly constructed membranes (**special protective sheaths or linings**), so that only oxygen and nutrients can enter the brain from the blood, and viruses, bacteria and chemical toxins will be kept *out*. But when the BBB is permeated or damaged by man-made non-ionizing radiation either at thermal or non-thermal levels, dangerous toxins can easily pass into the brain causing serious illness. The brain can also retain or lose fluids and experience changes in pressure. All this has the potential to lead to anything from **Dementia and Alzheimer's disease to malignant and benign tumors to Parkinson's disease to ALS and many other neurodegenerative diseases.**

LAYMAN'S SUMMARY OF ABSTRACT...

The following study found the **greatest amount of BBB (blood brain barrier) leakage at the lowest power density.** Specifically, **albumin (a blood protein)** was found present in the rats brain tissue. Albumin is not normally found in brain tissue—*unless the blood-brain barrier has been damaged*. Up to 50% of the rats in this study, exposed to non-ionizing radiation at non-thermal levels equal to or significantly lower than current SAR standards had albumin in their brains, indicating damage to the blood-brain barrier. Such albumin leakage can lead to any one of the above named illnesses. Clearly, heat based SAR standards are totally irrelevant in enabling this effect.

Blood-brain barrier permeability in rats exposed to electromagnetic fields used in wireless communication.

Bertil R. R. Persson, Leif G. Salford, Arne Brun.
Wireless Networks 3(6): 455-461, 1997.

<http://portal.acm.org/citation.cfm?id=272210>

Abstract:

“Biological effects of radio frequency electromagnetic fields (EMF) on the blood-brain barrier (BBB) have been studied in Fischer 344 rats **(a particular breed of rats)** of both sexes. The rats were not anaesthetized during the exposure. All animals were sacrificed by perfusion-fixation **(putting slices of the brain on slides and staining of the brains for accurate examination)** under chloral hydrate **(a type of anesthesia)** anesthesia after the exposure. The brains were perfused **(saturated)** with saline for 3–4 minutes, and thereafter perfusion fixed with 4% formaldehyde **(a preservative solution)** for 5–6 minutes. Whole coronal **(vertical direction)** sections of the brains were dehydrated and embedded in paraffin **(a type of wax)** and sectioned at 5 micrometers. **(one millionth of a meter)** Albumin **(a blood protein)** and fibrinogen **(another type of blood protein)** were demonstrated immunohistochemically **(applying an antibody that binds with the protein)** and classified as normal versus pathological **(abnormal)**. In the present investigation we exposed male and female Fischer 344 rats in a Transverse **(horizontal)** Electromagnetic Transmission line chamber to microwaves **(this is called a TEM chamber and it is a chamber designed to ensure that radiation exposure levels are the same everywhere within the chamber)** of 915 MHz **(MHz is megahertz, hertz measures frequency and 915 is the same frequency as some cell phone emissions)** as continuous wave (CW) **(same as analogue, not pulsed but continuous)** and pulse-modulated **(changing the frequencies of the signal by adding another pulse frequency to it and modulating or changing it)** with different pulse power and at various time intervals. The CW-pulse power varied from 0.001 W **(watts measures power and .001 is one thousandth of a watt.)** to 10 W **(10 watts)** and the exposure time from 2 min to 960 min. In each experiment we exposed 4–6 rats with 2–4 controls **(unexposed)** randomly placed in excited **(exposed)** and non-excited **(not exposed)** TEM-cells **(refers to the above TEM chamber)** respectively. We have in total investigated 630 exposed rats at various modulation frequencies and 372 controls. The frequency of pathological rats is significantly increased ($p < 0.0001$) **(p means probability; a probability of 0.0001 means 99.99% confidence that this result is not due to chance. That is an incredibly stark, significant and real statistic.)** from 62/372 (ratio: 0.17 ± 0.02) **(pm means plus or minus)** for control rats to 244/630 (ratio: 0.39 ± 0.03) in all exposed rats. Grouping the exposed animals according to the level of specific absorbed energy (J/kg) **(Joules per kilogram. Joule is the measurement of a unit of energy and kilogram is measurement of a unit of substance)** give significant difference in all levels above 1.5 J/kg. The exposure was 915 MHz microwaves either pulse modulated (PW) **(pulsed wave)** at 217 Hz with 0.57 ms **(millisecond or millionth of a second)** pulse width **(duration of pulse)**, at 50 Hz with 6.6 ms **(millisecond)** pulse width **(duration of pulse)** or continuous wave (CW). The frequency of pathological **(diseased)** rats (0.17) **(17%)** among controls **(unexposed rats)** in the various groups is not significantly different. The frequency of pathological rats **(diseased rats)** was 170/481 (0.35 ± 0.03) **(35%)** **(PM means plus or minus, give or take)** among rats exposed to pulse modulated (PW) and 74/149 (0.50 ± 0.07) among rats

exposed to continuous wave exposure (CW). These results are both highly significantly different to their corresponding controls ($p < 0.0001$) **(99.99% confidence that this is not due to chance)** and the frequency of pathological **(diseased)** rats after exposure to pulsed radiation (PW) **(pulsed wave)** is significantly less ($p < 0.002$) **(probability 99.98% this is not by chance)** than after exposure to continuous radiation (CW) **(continuous wave)**.

The same authors summarized their findings from more than two decades of research in an article published in 2008:

The Mammalian Brain in the Electromagnetic Fields Designed by Man with Special Reference to Blood-Brain Barrier Function, Neuronal Damage and Possible Physical Mechanisms.

Leif G. Salford, Henrietta Nittby, Arne Brun, Gustav Grafström, Lars Malmgren, Marianne Sommarin, Jacob Eberhardt, Bengt widegren and Bertil R.R. Persson.

Progress of Theoretical Physics. Supplement No. 173 (2008): 283-309.

"The most remarkable observation was that exposure with whole-body average power densities below 10mW/kg **(milliwatts per kilogram)** gave rise to a more pronounced albumin **(blood protein)** leakage than higher power densities, all at non-thermal **(no heat whatsoever)** levels. If the reversed situation were at hand, we feel that the risk of cellular telephones, base-stations and other RF emitting sources could be managed by reduction of their emitted energy. The SAR value of around 1 mW/kg **(milliwatt per kilogram)** exists at a distance of more than one meter **(approx. 3 feet)** away from the mobile phone antenna and at a distance of 150-200 meters **(approx. 600 feet)** from a base station. This has led us to coin the concept of passive mobile phoning for all non-users who are exposed."

This quote from the authors means that we are absorbing damaging radiation from cell towers even at 200 meters away, or approximately 650 feet. In accordance with the results of these studies, this means that we are all being exposed as if we were a few feet away from a mobile phone merely by being in the presence of the radiation from cell towers. This would imply BBB leakage merely by being in the presence of radiation from cell towers. That is how strong non-thermal effects of low power density are and how delicate our own biology is. The summary of the results of this study implies that ANY wireless RF emitting device or structure, whether it be a cell phone, cell tower, smart meter or WIFI, causes damage to the brain. Mind you, they did not study the heart or other parts of the rat, so it is possible to hypothesize similar damage to other organs.

Also, the authors are saying that the lowest levels of radiation (or power densities) permeated and damaged the blood brain barrier more easily than the higher levels of radiation (or power density). This implies that low emission cell phones, cordless phones or bluetooth ear pieces that are thought to be safer because they emit less power, may in fact even be more dangerous in terms of BBB damage and albumin leakage.

Thus lower SAR phones are not safer than higher SAR phones in terms of BBB leakage and potentially even more harmful.

Thus SAR as we use it, is an inappropriate measure by which to judge the safety of cell phones and other wireless equipment.

The safety should be judged on biological and health effects.

2) Brain cell damage/cell death

Greater power density = more biological damage

Layman's summary of abstract...

In the following abstract, neuron damage (*nerve cell damage*) varied with power density...The greater the power density the greater the nerve cell damage. **Heat-based SAR standards are totally irrelevant to this study. In other words, nerve cell damage occurred at non-thermal levels and at power levels hundreds to thousands of times below current SAR exposure limits.**

Nerve cell damage in mammalian brain after exposure to microwaves from GSM mobile phones

Salford LG, Brun AE, Eberhardt JL, Malmgren L, Person BRR.
Environmental Health Perspectives 111(7): 881-883, 2003.

<http://www.ncbi.nlm.nih.gov/pubmed/12782486>

Abstract:

The possible risks of radio-frequency electromagnetic fields for the human body is a growing concern for our society. We have previously shown that weak pulsed microwaves give rise to a significant leakage of albumin (**blood protein**) through the blood-brain barrier (**protective “shield” between the blood vessel and the brain**). In this study we investigated whether a pathologic (**abnormal**) leakage across the blood-brain barrier might be combined with damage to the neurons (**brain cells**). Three groups each of eight rats were exposed for 2 hours to Global System for Mobile Communications (GSM) mobile phone electromagnetic fields (**manmade radiation from a cell phone composed of electric and magnetic fields which together create radiation, exposure to which is known to cause cancer and other illnesses**) of different strengths. We found highly significant ($p < 0.002$) (**p means probability; probability 0.002 means 99.8% confidence that this is not due to chance**) evidence for neuronal (brain cell) damage in the cortex (**thinking part of the brain**), hippocampus (**memory part of the brain**), and basal ganglia (**motor control/learning part of the brain**) in the brains of exposed rats.

Below is a quote from the text of the actual study:

“The occurrence of dark neurons (**damaged or dead neurons**) under the different exposure conditions is presented in Figure 3 which shows a significant positive relation between EMF dosage (SAR) and number of dark neurons.”

What was not included in abstract is the following.... There was more neuron damage at greater power levels, but even at the lowest SAR levels, which were 800 times lower than current exposure limits, half of the rats had neuron damage related to the exposure. Also, a single two-hour exposure to an actual cell phone, damaged up to 2% of the neurons in the rats' brains.

A very important factor in the role of biological effects on cells with non-thermal, non-ionizing radiation is called **resonance (when the cell is “in synch” or “in tune” with that particular power density or frequency).**

IN VITRO STUDIES (in a test tube)

FREQUENCY and MODULATION

3) Calcium leakage from brain cells.

We need calcium for all kinds of things from bone density to neuron, cardiac and muscle and nerve cell functioning. Calcium is used as a signal to regulate many processes that go on inside cells, moving from one part of the cell to another to turn different metabolic processes on and off. It is thought that abnormal calcium signaling may be linked to **Alzheimer’s disease**. Calcium may play a role in **multiple sclerosis** by activating enzymes that break down myelin (**a sheet of fatty tissue that surrounds and insulates nerves**). **ALS** is associated with increased levels of extracellular calcium.

Radio frequency radiation that disturbs calcium concentrations can predispose to these diseases.

In this study we focus on the effects of both **frequency** and **modulation**...

The importance of frequency:

When the signal is modulated (**varied**) at certain frequencies (**rate of vibration or oscillation of wave**), the effect of calcium efflux (**calcium leakage**) occurs. When modulated at other frequencies this effect either did not occur at all, or occurred to varying degrees.

The importance of modulation:

When the signal is modulated (**varied**), calcium efflux (**calcium leakage**) occurs in brain cells. When the signal is not modulated (in this case, amplitude modulated), this does not occur.

So calcium efflux occurred to different degrees at different frequencies and at different rates of modulation (in this case, modulation refers to how fast or slow you are varying the wave although there are different

ways to modulate the signal). In fact, calcium efflux occurred very dramatically at some modulation frequencies and not at all at others.

The bottom line is the levels of calcium flowing into and out of brain cells changed dramatically when exposed to RF radiation, but only when modulated and at certain frequencies. Thus the effects were **FREQUENCY** and **MODULATION** dependant. **Additionally, the levels of exposure were hundreds to thousands of times less than current exposure standards. And finally, no heat was involved. Only non-thermal levels were used.**

Layman's summary of abstract...

Calcium efflux (**calcium leakage**) occurred from chick brain tissue to different degrees at different frequencies and at some frequencies no calcium leakage occurred at all. However, no matter what the frequency, the signal had to be amplitude modulated (**signal strength changed**) to get the effect of calcium efflux. When the signal was continuous or not amplitude modulated, there was no calcium leakage no matter what the frequency.

Effects of ELF (1-120 Hz) and modulated (50 Hz) RF fields on the efflux of Calcium ions from brain tissue *in vitro*

<http://www.ncbi.nlm.nih.gov/pubmed/3977964>

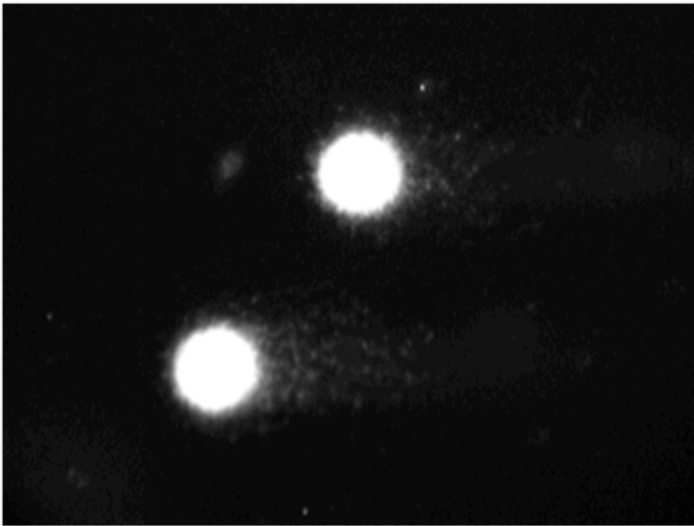
Blackman CF, Benane SG, House DE, Joines WT. *Bioelectromagnetics* 6:1-11, 1985.

Abstract

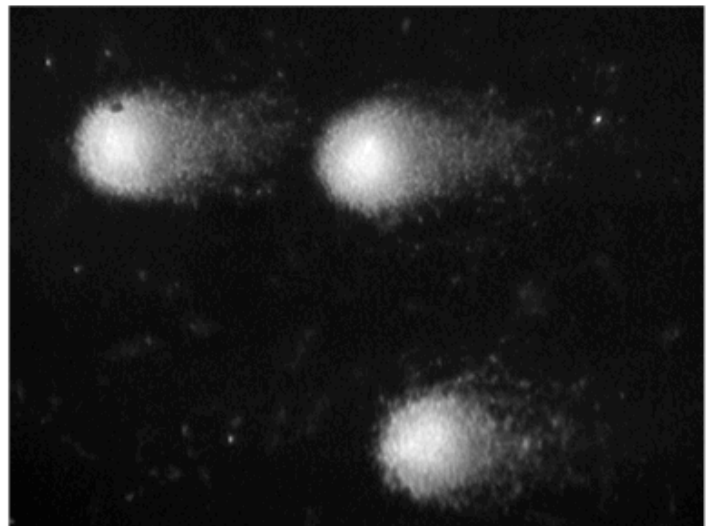
We have previously shown that 16-Hz (**Hertz measures frequency, so 16 Hz would be 16 oscillations per second**) sinusoidal (**smooth, continuous, S shaped as opposed to saw or square shaped**) electromagnetic fields can cause enhanced efflux (**flowing out**) of calcium ions (**calcium is necessary for proper functioning as listed above and ions are charged particles which can lead to cancer**) from chick brain tissue, *in vitro*, (**in a test tube as opposed to live animal**) in two intensity regions centered on 6 and 40 Vp-p/m (**volts peak to peak per meter, so peak to peak meaning top of the wave to bottom of wave. A wave in this instance is an electro magnetic wave going up and down like a sideways S or a sideways S with squared edges. So peak to peak would mean the top and bottom of one of those electric magnetic waves. Basically it is a measure of the intensity of the electric field**). Alternatively, 1-Hz and 30-Hz fields at 40 Vp-p/m did not cause enhanced efflux. We now demonstrate that although there is no enhanced efflux associated with a 42-Hz field at 30, 40, 50, or 60 Vp-p/m, a 45-Hz field causes enhanced efflux in an intensity range around 40 Vp-p/m that is essentially identical to the response observed for 16-Hz fields. Fields at 50 Hz induce enhanced efflux in a narrower intensity region between 45 and 50 Vp-p/m,

while radio frequency carrier waves, amplitude modulated (**carrier refers to the wave that carries info onto which other waves can be placed or “piggy backed”, amplitude modulated means the resulting wave changes in strength according with the “piggy backed” signal**) at 50 Hz, also display enhanced efflux over a narrow power density range. Electromagnetic fields at 60 Hz cause enhanced efflux only at 35 and 40 Vp-p/m, intensities slightly lower than those that are effective at 50 Hz. Finally, exposures over a series of frequencies at 42.5 Vp-p/m reveal two frequency regions that elicit enhanced efflux--one centered on 15 Hz, the other extending from 45 to 105 Hz.

PHASE MODULATION

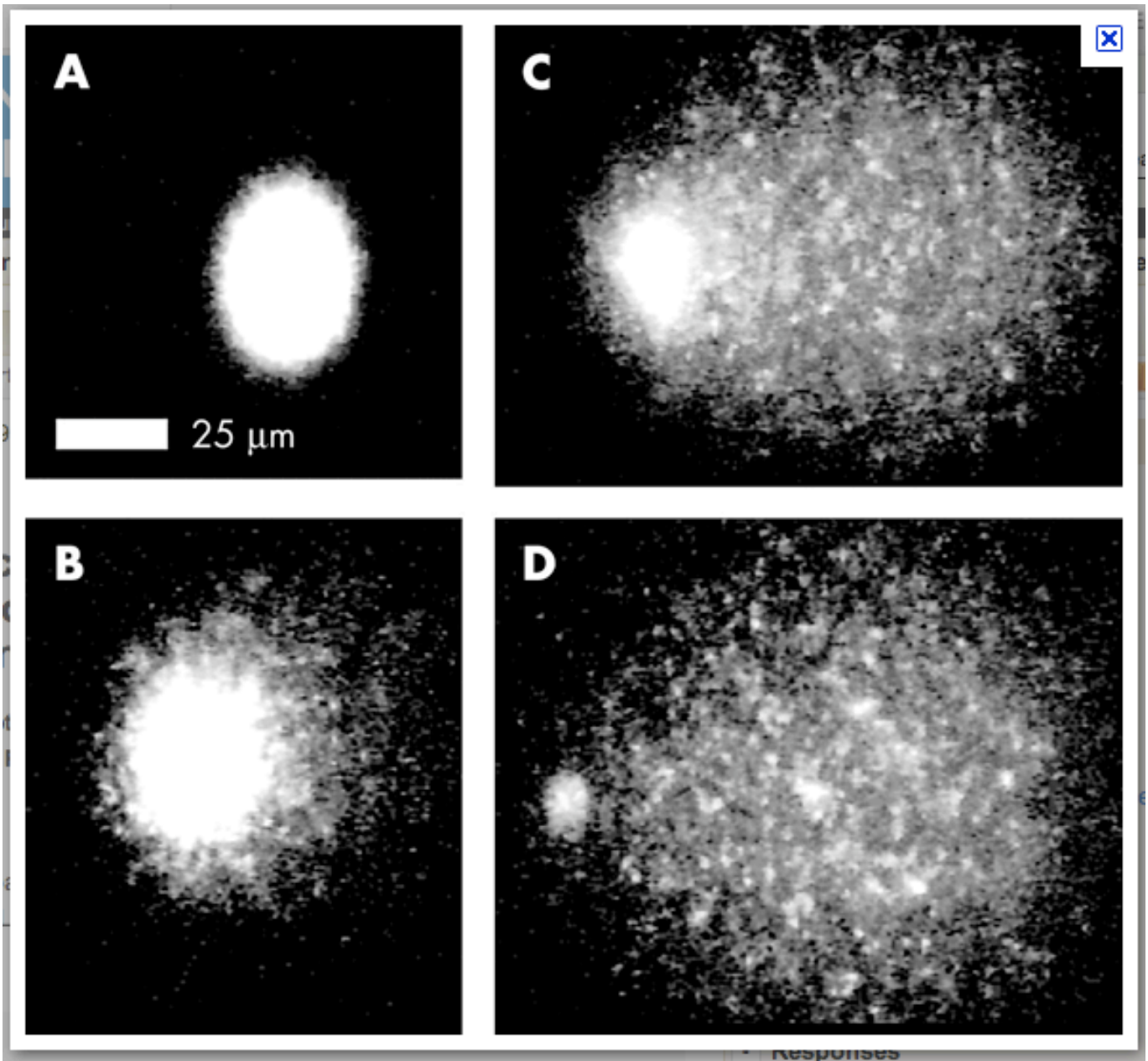


Control



Microwaves

Above picture of damaged DNA, courtesy of Dr. Henry Lai, shows DNA via the COMET ASSAY after exposure to 2450 Mhz of cell phone radiation. Picture on the right is after cell phone radiation exposure, showing a “comet tail”, which is the disintegration of the DNA showing fragmented DNA forming a “comet tail”.



The above picture is of extreme DNA destruction after exposure to radiation, viewed via the comet assay.

Although the following study did go up to 2 W/kg, there were many examples at .02 W/kg and other numbers below our safety standard of 1.6 W/kg where we can see the same type of damaging effect on cells. 2 W/kg is the European SAR safety standard. On a side note, Europe now measures their SAR safety standards over 10 grams of tissue as opposed to 1 gram as we do here in the US. This allows for more exposure to non-ionizing radiation, with “less effects” to show for it in studies...Tricky, huh? This was a clever industry idea to be able to get away with using more power without showing more effects, but with very serious, consumer health and life repercussions. The US rejected this new standard of measurement that industry would liked to have used here as well...I guess you could say we did one thing right.

Layman's Summary of Abstract

UMTS transmission, or 3G has genotoxic effects on cells. UMTS or 3G is a type of phase modulation and delivers the signal in highly toxic ways, such as making the wave jagged as opposed to smooth and splitting the wave up into potentially hundreds of different frequencies.

<http://www.ncbi.nlm.nih.gov/pubmed/18278508>

CONCLUSION: UMTS exposure may cause genetic alterations in some but not in all human cells in vitro.

Int Arch Occup Environ Health. 2008 May;81(6):755-67. Epub 2008 Feb 16.
Radiofrequency electromagnetic fields (UMTS, 1,950 MHz) induce genotoxic effects in vitro in human fibroblasts but not in lymphocytes.
Schwarz C, Kratochvil E, Pilger A, Kuster N, Adlkofer F, Rüdiger HW.
Division of Occupational Medicine, Medical University of Vienna, Waehringer Guertel 18-20, 1090, Vienna, Austria.

Abstract

OBJECTIVE: Universal Mobile Telecommunication System (UMTS) **(UMTS is a type of spread spectrum phase modulation. Spread spectrum is using a range of frequencies for the carrier wave, which carries information by changing abruptly in smoothness to jagged or different shapes. UMTS also splits up the carrier wave into many different frequencies, so it is the equivalent of say a hundred or potentially hundreds of different carrier waves all in one transmission)** introduced as the third generation mobile communication standard in Europe. This was done without any information on biological effects and genotoxic **(genetic damage to cells)** properties of these particular high-frequency electromagnetic fields **(short wave, fast oscillating energy, sometimes at billions**

of cycles per second). This is discomforting, because genotoxic effects of the second generation standard Global System for Mobile Communication have been reported after exposure of human cells in vitro **(in test tube).**

METHODS: Human cultured fibroblasts **(a ubiquitous cell type important to tissue integrity)** of three different donors and three different short-term human lymphocyte **(white blood cells, a key part of the immune system)** cultures were exposed to 1,950 MHz UMTS below the specific absorption rate (SAR) safety limit of 2 W/kg. The alkaline comet assay **(an alkaline solution as opposed to an acidic solution used to asses the comet assay which allows you to see the broken bits of DNA in the form of the tail of the comet. The comet assay is simply the name of the way you asses broken or fragmented DNA which takes the shape of a comet...see below picture)** and the micronucleus assay **(a way to look at inside of cell to see if it's been broken up into fragments)** were used to ascertain dose and time-dependent genotoxic effects. Five hundred cells per slide were visually evaluated in the comet assay and comet tail factor (CTF) **(the measurement of amount of DNA damage seen in the comet tail)** was calculated. In the micronucleus **(part of the nucleus of the cell that contains genetic material))** assay 1,000 binucleated **(having two nuclei)** cells were evaluated per assay. The origin of the micronuclei was determined by fluorescence labeled anticentromere **(antibodies that occur in autoimmune disorders)** antibodies. All evaluations were performed under blinded conditions.

RESULTS: UMTS **(Universal Mobile Telecommunications System or 3G)** exposure increased the CTF **(comet tail factor)** and induced centromere-negative **(a fragment of DNA which does not contain the centromere which is the normal place where cell divide)** micronuclei **(bits of fragmented nucleus of the cell)** (MN) in human cultured fibroblasts in a dose and time-dependent way. Incubation for 24 h at a SAR of 0.05 W/kg generated a statistically significant **(95% or higher confidence this is not by chance)** rise in both CTF and MN ($P = 0.02$). At a SAR of 0.1 W/kg the CTF was significantly increased after 8 h of incubation ($P = 0.02$), the number of MN after 12 h ($P = 0.02$). No UMTS effect was obtained with lymphocytes, either unstimulated or stimulated with Phytohemagglutinin **(that stimulates metabolic activity).**

CONCLUSION: UMTS exposure may cause genetic alterations in some but not in all human cells in vitro.

PULSE MODULATION

4) Heart arrhythmia/heart stoppage

Layman's summary of abstract...

When a wave is pulsed at a particular time during the heart's rhythm, you can cause arrhythmia (irregular heart beat) and even stop the heart.

Please note, this paper is very old and does not have an abstract. Instead we provide excerpts from the actual study.

Pulse modulated UHF energy illumination of the heart associated with change in heart rate.

Frey AH, Seifert E. Life Sciences 7 (Part II): 505-512, 1968.

"Recently Frey³, the Library of Congress⁷, and Kholodov⁵, reviewed and evaluated data on the central nervous system effects of illumination by energy in the very high frequency (VHF), ultra high frequency (UHF), and super high frequency (SHF) regions of the electromagnetic spectrum. They concluded the data indicate that the energy affects the nervous system when used at low power densities. More recently Frey⁴ showed that illumination of the head of the cat with pulse modulated UHF energy at low power density (30 microwatts/cm², average) **(30 microwatts per square of a centimeter)** evoked potentials **(voltage, indicating nervous response)** in the brain stem. These effects would not be expected in terms of current theory **(current theory being non- thermal levels have no effect)**. Beyond implications for theory, there are practical implications since UHF energy has become a pervasive environmental agent in recent years.

"There are also reports of heart rate change correlated with VHF energy illumination **(irradiation)** which have similar implications. These reports include clinical observations such as that of Drogichina, Konchalovskaya, Glotova, Sadchikova, and Snegova¹ and experimental investigations such as those reported by Presman and Levitina. In two joint investigations using rabbits, Presman and Levitina^{9,10} report finding small reversible changes in heart rate associated with low intensity VHF energy illumination (radiation) **(λ (this symbol means wavelength) = 10 cm., 12.5 cm.)**. The effect on rate **(heart rate)** was a function of the region of the body illuminated **(was a result of which part of the body was irradiated)**. In general, head illumination was associated with tachycardia **(rapid heart beat)** and body illumination with bradycardia **(slow heart beat)**. More recently, Levitina⁶ reported that illumination of intact frogs with low intensity VHF energy (power density 60 μ **(this symbol means micro)** W/cm², **(watts per square centimeter or watts per a centimeter shaped like a square with each side being one**

centimeter long) λ (this symbol means wavelength) = 12.5 cm.) (so the power density was 60 microwatts per square of a centimeter and the length of the wave was 12.5 centimeters meaning the frequency was 2.4 GHz – very close to 3G mobile, cordless and WIFI frequencies) resulted in a change in heart rate similar to the change observed in rabbits. He suggested that the rate change in the frog was due to an effect on the peripheral (**outer nervous system as opposed to central nervous system which is the brain and spinal cord**) nervous system. At the wavelengths he used, one would expect little body penetration of the energy^{2,3}. thus, a skin receptor hypothesis (**nerve endings in skin would influence heart rate**) is reasonable. The above cited head illumination (**irradiation**) data, however, do not fit his hypothesis.

“It seemed likely that the use of UHF (**ultra high frequency**) energy, which penetrates tissue and is more appropriate as a tool in biological experimentation³, might clarify the situation. Further, it seemed that if this energy affected the heart, as such, then it would be likely⁴ that the effect would appear most clearly when the isolated frog hear was illuminated (irradiated) with low intensity pulsed modulated energy. On a logical basis, the most useful procedure appeared to be synchronization of the UHF energy pulses with the P wave (**one of the waves in the heart rhythm**) of the ECG (**electrocardiogram**) in an attempt to induce a positive feedback condition (**a resonance effect**). It was considered possible that this would result in tachycardia (**fast heart rate**), arrhythmia (**irregular heart beat**), or fibrillation (**heart quivers instead of beats**). Such results did occur as described in the experiment reported below.

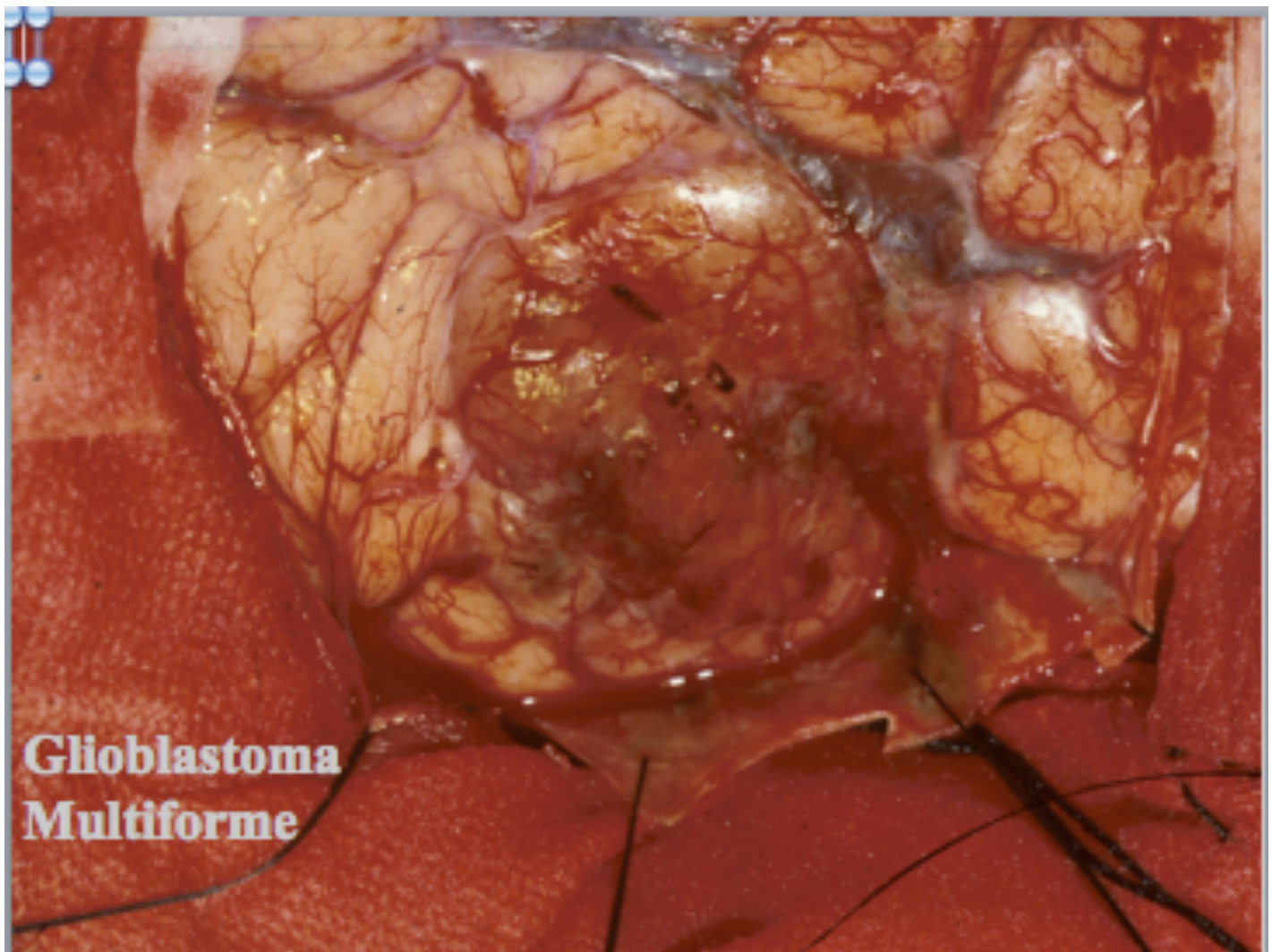
“Twenty-two isolated frog hearts were illuminated with UHF energy pulses that were synchronized with the P (**one of the waves in the heart rhythm**) wave of the ECG (**electorcardiogram**). The UHF source was set to emit pulses 10 μ sec (**microseconds**) in duration at a carrier frequency of 1.425 GHz (**similar to cell phone frequencies**).

The peak power density used was 60 mW/cm² (**60 milliwatts per square centimeter**) At the rate of one 10 μ sec (**10 microseconds**) the average power density was negligible, i.e., 0.6 microwatts/cm² (**this is similar that found up to 500 feet from a cell phone base station**).

“When the heart was illuminated (**irradiated**) 200 msec (**milliseconds**) after the P wave (**one of the waves in the heart rhythm**) , about the time the QRS (**part of the heart rhythm**) complex occurred in our experimental situation, the beat rate increased. This increase was statistically significant at the .01 (**99% confidence of occurance**) level... In half the cases, arrhythmias (**irregular heart beat**) occurred and they were associated with illumination (**irradiation**). On occasion, the heart ceased (**completely stopped**) after a period of arrhythmia (**irregular heart rhythm**).”

EPIDEMIOLOGY STUDY (Study of human populations)

5) Malignant and benign brain tumors



The above picture, from a presentation by Dr. Leif Salford, Professor and Chairman of the Department of Neurosurgery, University Lund, Sweden is a typical type of malignant brain tumor that is known amongst neurologists to be associated with cell phone use. It kills most of it's hosts within a year's time, sometimes 5 or maybe even 10 on the rare occasion. It does eventually kill it's host though. Long term survival is rare to non-existent.

Layman's summary of abstract...

- 1) 230% increase in brain tumors for adults with greater than 10 years of cell phone use.
- 2) 400% increase in brain tumors for adults with greater than 10 years of cordless phone use.
- 3) 420% increase with children who begin using the cell phone before the age and 20 and with greater than 1 year of usage.
- 4) 340% increase in brain tumors for children who begin using the cordless phone before the age of 20 and with greater than 1 year of usage.
- 6) 200% increase in acoustic neuroma for adults who use the cell phone with greater than 10 years.
- 7) 130% increase of acoustic neuroma with greater than 10 years of cordless phone use.

Mobile Phones, cordless phones and the risk for brain tumours

Authors: Lennart Hardell, Michael Carlberg

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<http://www.ncbi.nlm.nih.gov/pubmed/19513546>

DOI: 10.3892/ij0_00000307

Pages: 5-17

The Hardell-Group conducted during 1997-2003 two case control **(people with and without brain tumors)** studies on brain tumors including assessment of use of mobile phones and cordless phones. The questionnaire was answered by 905 (90%) cases **(people with brain tumors)** with malignant brain tumors, 1,254 (88%) cases with benign tumors and 2,162 (99%) population based controls **(people without brain tumors)**. Cases were reported from the Swedish Cancer Registries. Anatomical **(physical)** area in the brain for the tumor was assessed and related to side of the head used for both types of wireless phones. In the current

analysis we defined ipsilateral (**same side of head as tumor**) use \geq (**this sign means greater than or equal to**) 50% of the use and contralateral (**opposite side**) use as $<$ (**less than**) 50% of the calling time. We report now further results for use of mobile and cordless phones. Regarding astrocytoma (**usually slow growing, benign brain tumor which can become malignant**) we found highest risk for ipsilateral mobile phone use in the $>$ (**greater than**) 10 year latency group, OR 3.3, 95% CI 2.0-5.4 {**Okay, here we go...OR means odds Ratio, or ratio of probability. Anything over 1 or under 1 means increase or decrease. 1 is the starting point though. So 3.3 means 230% increase because we don't count the first 1 since this was where we started. 95% means the odds of this happening are 95% or extremely high and 95% is the scientific bar to reach for your results to be significant. CI means confidence interval; or what the range of chance of occurrence is. So most probably it's 230% but there is a 95% probability that the increase is at lowest 100% (2.0) and as high as 440% (5.4) increase, but most likely 230% increase. So CI is the range of risk the 95% is the probability. So if we have an OR of 3.3 with 95% CI 2.0-5.4 that means we have a statistically significant result (95%) of a 230% increase in tumors and we are 95% confident that there were between 2.0-5.4 times as many tumors in this group**) and for cordless phone use OR=5.0, 95% CI=2.3-11 (**so for cordless phone use there was a 400% increase with a 95% probability and the confidence interval is between 130% and 1,000% meaning there is on the high side, up to a 1,000% increase in these tumors!!!**). In total, the risk was highest for cases with the first use <20 years age, for mobile phone OR=5.2, 95% CI=2.2-12 (**so if you were under 20 when you first used a cell phone, you are 5.2 times as likely to get a tumor, or will have a 420% increase and we are 95% confident this will happen between 120% of the time and 1,100% of the time**) and for cordless phone OR=4.4, 95% CI=1.9-10 (**4.4 times as likely and 95% chance of this happening between 90% and 900% of the time**). For acoustic neuroma, the highest OR was found for ipsilateral use and >10 year latency, for mobile phone OR=3.0, 95% CI=1.4-6.2 (**200% increase in acoustic neuroma from mobile phone use and we are 95% confident this will happen anywhere from a 40% to 520% of the time**) and cordless phone OR=2.3, 95% CI=0.6-8.8 (**cordless phones, 130% increase and we are 95% confident this will happen between 60% and 780% of the time**) Overall highest OR for mobile phone use was found in subjects with the first use at age <20 years, OR=5.0, 95% CI 1.5-16 (**so if you were under 20 when you started using your cell phone, your overall average risk of brain tumor is increased by 400%, we are 95% confident that this will happen between 50% and 1,500% of the time**) whereas no association was found for cordless phone in that age group, but based only on one exposed case (**this means that in this age group, only one person was using a cordless phone, whereas everyone else was using their mobile phone**). The Annual age-adjusted incidence of astrocytoma for the age group >19 years increased significantly by +2.16%, 95% CI +0.25 to +4.10 during 2000-2007 in Sweden in spite of seemingly underreporting of cases to the Swedish Cancer registry. A decreasing incidence was found for acoustic neuroma during the same period. However, the medical diagnosis and treatment of this tumor type has changed during recent years and

underreporting from a single center would have a large impact for such a rare tumor. **(In other words, if even one clinic or hospital under-reported their tumors, this would throw the nationwide statistics off significantly.)**

In the US, even though tumor reporting is mandated through legislation, the legislation is not enforced and many states do not report brain tumor incidence AT ALL. This may explain why the US statistics are so inaccurate. Additionally, the average latency time for cancer is 30 years. The subjects in the above study have over-performed in terms of average time for tumors to show up. They are the “canaries in the coal mine”. Their cancers have appeared more quickly than average. With statistics like these and knowing the average latency time for cancer is much longer than 10 years, we are in for an epidemic of brain tumors if people do not change the way they use their cell phones. A simple warning label would make people aware of the risk so that they could choose to change the way they use their cell phones.

ADDITIONAL STUDIES OF NOTE...

SPERM STUDY, CLEVELAND CLINIC

6) Sperm cell damage and death

Layman's summary of abstract...

The following study is pretty self-explanatory. But we will sum it up here... Sperm died or were deformed when exposed to cell phone radiation.

Effect of cell phone usage on semen analysis in men attending infertility clinic: an observational study

Ashok Agarwal, Ph.D., H.C.L.D.,^a Fnu Deepinder, M.D.,^a Rakesh K. Sharma, Ph.D.,^a Geetha Ranga, Ph.D.,^b and Jianbo Li, Ph.D.

<http://www.ncbi.nlm.nih.gov/pubmed/17482179>

Reproductive Research Center, Glickman Urological Institute and Department of Obstetrics-Gynecology, Cleveland Clinic Foundation, Cleveland, Ohio; ^b Karthekeya Medical Research and Diagnostic Center, Mumbai, India; and ^c Department of Quantitative Health, Cleveland Clinic Foundation, Cleveland, Ohio

Objective: To investigate the effect of cell phone use on various markers of semen quality.

Design: Observational study.

Setting: Infertility clinic.

Patient(s): Three hundred sixty-one men undergoing infertility evaluation were divided into four groups according to their active cell phone use: group A: no use; group B: <2 (**less than**) h/day; (**hours per day**). group C: 2–4 h/day; and group D: >4 (**greater than**) h/day.

Intervention(s): None.

Main Outcome Measure(s): Sperm parameters (**properties of the sperm**) (volume, (**quantity of sperm**) liquefaction time (**time it takes for semen to liquefy**), pH

(acidity), viscosity (how thick it is), sperm count (how many), motility (how mobile), viability (how alive it is) , and morphology (structure of sperm, in other words is it deformed or normal).

Result(s): The comparisons of mean **(average)** sperm count, motility, viability, and normal morphology **(structure)** among four different cell phone user groups were statistically significant **(commonly means 95% confidence or higher)**. Mean (average) sperm motility, viability, and normal morphology **(structure)** were significantly different in cell phone user groups within two sperm count groups. The laboratory values of the above four sperm parameters **(properties of sperm)** decreased in all four cell phone user groups as the duration of daily exposure to cell phones increased.

Conclusion(s): Use of cell phones decrease the semen quality in men by decreasing the sperm count, motility, viability, and normal morphology. The decrease in sperm parameters was dependent on the duration of daily exposure to cell phones and independent of the initial semen quality **(no matter how healthy sperm was before the study, use of cell phones decreased sperm count, motility, viability and damaged their form)**. (Fertil Steril 2008;89:124–8. ©2008 by American Society for Reproductive Medicine.)

9) Funding bias in studies on this issue

Layman's summary of abstract

When this issue of EMR (electro magnetic radiation) and health effects is being studied, a **statistically significant effect will be found 82% of the time if the study is independently funded and only 33% of the time if the study is industry funded.** Both results were statistically significant, meaning 95% chance or higher these number are not by accident. Conclusion..there is clear and present funding bias in studies on EMR, biased in favor of “no effect” when industry funded, “effect” when independently funded. This means industry funded studies cannot be relied to give accurate information on this issue.

SOURCE OF FUNDING AND RESULTS OF STUDIES OF HEALTH EFFECTS OF MOBILE PHONE USE: SYSTEMATIC REVIEW OF EXPERIMENTAL STUDIES

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OBJECTIVES; There is concern regarding the possible effects of cellular telephone use. We examined whether the source of funding of studies of the effects of low-level radiofrequency radiation is associated with the results of studies. We conducted a systematic review of studies of controlled exposure to radiofrequency radiation with health-related outcomes [Electroencephalogram, **(EEG, measures brain waves)** cognitive **(thinking)** or cardiovascular **(heart and blood vessels)** function, hormone levels, symptoms, and subjective well being **(symptoms)** .]

DATA SOURCES: We searched EMBASE, Medline and a specialist database in February, 2005 and scrutinized reference lists from relevant publications.

DATA EXTRACTION: Data on the source of funding, study design, methodological quality, and other study characteristics were extracted. The Primary outcome was the reporting of at least one statistically significant **(95% or higher)** association between the exposure and a health related outcome. Data were analyzed using logistic regression models **(method of analyzing numbers)**.

DATA SYNTHESIS: **(Data summary)** Of 59 studies, 12 (20%) were funded exclusively by the telecommunications industry, 11 (19%) were funded by public agencies of charities, 14 (24%) had mixed funding (including industry), and in 22 (37%) the source of funding was not reported. Studies funded exclusively by industry reported the largest number of outcomes, **(were analyzed in the greatest number of ways)** but were least likely to report a statistically significant result: The odds ratio **(likelihood of having an effect)** was 0,11 (95% confidence interval, 0.02-0.78), compared with studies funded by public agencies or charities. This finding was not materially altered **(significantly changed)** in analysis adjusted **(when data was analyzed in a different way, in other words, no matter how the data was analyzed, they got the same results)** for the number of outcomes reported , study quality, and other factors.

EXPERT FROM TABLE 2 of This Study

No. (%) of studies with at least one result suggesting an effect at ($p < 0.05$)

| | | | |
|-----------------|-----------------------|---------------|----------------------|
| Industry 4 (33) | Public/Charity 9 (82) | Mixed 10 (71) | Not Reported 17 (77) |
|-----------------|-----------------------|---------------|----------------------|

(From above, the number to the left is the number of studies looked at, the number in parenthesis is the percent of studies that found a statistical effect.)

Author's conclusion from this study...

CONCLUSIONS: The interpretation of results from studies of health effects of radiofrequency radiation should take sponsorship into account.

KEY WORDS: electromagnetic fields, financial conflicts of interest, human laboratory studies, mobile phones, Environ Health Perspect 115:1-4 (2007). Doi: 10.1289/ehp.9149 available via <http://dx.doi.org/> [Online 15 September 2006]

Our Conclusion from this study and this paper...

CONCLUSIONS: Fiscal sponsorship weighs heavily on the outcome of studies. When assessing the credibility of a study on electro-magnetic fields and non-ionizing, wireless, radiation-emitting devices, the first thing that needs to be established is who funded the study. Once this has been established, then the study should be considered with the knowledge that financial bias plays an extraordinary role in the results of studies when funded by the same industry who also stands to profit from the product or properties of the product being studied.

Additionally, government agencies whom the public have come to rely on for health and safety consider industry funded research to the exclusion of independently funded research when establishing health and safety standards for electromagnetic fields and non-ionizing, radiation-emitting products. The public needs to re-assess

it's faith or expectations of these agencies, since public health is clearly not the priority when weighed against profits from industry. In that vein, since it is quite clear that *only* industry interests are currently represented worldwide on this issue at the government regulatory agency level and to the exclusion of public health and safety, new agencies who's *only* goal is public health and who *only* considers independent studies as opposed to industry funded studies needs to be established. Fair and balanced governing on this issue is currently non-existent in our federal regulatory agency system.

We hope this paper sheds some light on both the science and the politics of this issue for citizens and local government authorities who's goal might be the protection of public health and safety.

We hope to encourage action at the local and state level until such time as federal protections are implemented...However, that may be a long ways away and historically comes only after epidemic proportions of illness and death. We hope to avoid that scenario and encourage you to act now at the local and state level to protect your selves until we have raised enough awareness to bring federal protection and possibly develop new agencies with public health protection being it's *only* goal. We are here to support should you need it.

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