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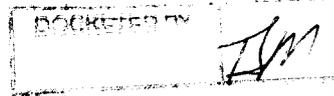
Arizona Corporation Commission

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APR 19 2013

April 17, 2013

Bob Stump, Chairman
Arizona Corporation Commission
Commissioners Wing
1200 West Washington – 2nd Floor
Phoenix, Arizona 85007



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Cc: Commissioner Gary Pierce Senator John McCain
Commissioner Brenda Burns Senator Jeff Flake
Commissioner Bob Burns Mayor Greg Stanton
Commissioner Susan Bitter Smith Arizona Public Service
Arizona Republic Newspaper Local News Channels

APS's Smart Meters: Smart for Public Health -or-
Smart for the Public Utility?

Dear Mr. Stump:

I vigorously oppose Arizona Public Service's (APS) current proposal to discriminate against any Arizona resident who declines APS's installation of their "Smart Meter" with an unreasonably punitive fee and rate structure on the grounds that leading experts in the field of clinical medicine and public health attest that Smart Meter pulsed RF (radio frequency) emissions may pose a serious threat to human health, the full extent of which is only beginning to be studied and appreciated by the larger scientific community. Given these unequivocal cautions, I believe that Arizona residents should be given a choice in the installation of these meters on their property without sanction from APS, a publically regulated utility. Aside from my public interest as a concerned citizen, my own medical history prompts a very personal interest in your ruling. However, my situation is far from unique. As you review the expert opinions expressed in my letter, I believe that you'll agree that the safety profile of Smart Meter emissions has not been established and that their emissions may pose a danger to public health.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Two

Smart Meters: Cocked & Loaded

While I am not qualified to present a comprehensive report on all clinical and research findings of Smart Meter emissions, I can share the relevant medical opinions of two preeminent American physicians with decades of research and clinical experience on the effects of Smart Meter's non-ionizing radiation upon human health.

Whereas the human health hazards of ionizing radiation such as x-rays are well known, the non-ionizing radiation generated by Smart Meters requires critical study as leading physicians and researchers report that EMF (Electromagnetic Field) and RF emissions are linked to specific human disease states including cancer. ^(1,2)

Although the bio-effects of Smart Meters remain untested in large, scientifically-controlled studies, leading experts such as **David Carpenter, MD**, a Harvard-trained physician and former Director of the New York State Department of Public Health, strongly caution against their use based upon decades of research into the adverse health effects resulting from EMF & RF exposure. Dr. Carpenter currently directs the Institute for Health & the Environment at the University of Albany in New York where he also is a Professor of Environmental Health Sciences.

Dr. Carpenter states:

"We have evidence that exposure to radio frequency radiation increases the risk of cancer, increases damage to the nervous system, causes electro-sensitivity & adverse reproductive effects, and causes a variety of other effects on different organ systems. There is no justification for the statement that Smart Meters have no adverse health effects." (Emphasis mine) ⁽¹⁾

Dr. Carpenter also states that many clinicians report patients who present with an unusual constellation of symptoms such as headache, sleep disturbance, arrhythmias and heart palpitations when exposed to pulsed Smart Meter RF emissions. In fact, controlled studies have found adverse health effects from exposure to pulsed RF emissions at the same magnitude and frequency as those produced by Smart Meters.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Three

William Rea, M.D., another expert on the human effects of RF and EMF exposure, is a preeminent authority in the field of **Environmental Medicine**. Dr. Rea's four medical texts, *Chemical Sensitivity Volumes I thru IV*, form the gold standard in the foundation of Environmental Medicine study. This acclaimed Dallas physician and surgeon (who also taught medicine & mathematics) was the thoracic surgeon who removed the bullet from then-governor John Connally who was shot during the Kennedy assassination. Dr. Rea, an expert in the fields of Toxicology and Environmental Medicine, founded and directs the Environmental Health Center in Dallas, Texas, an institution that has treated over 100,000 patients from around the world. Dr. Rea has also published over 100 peer-reviewed medical research papers and authored two books on environmentally-safe home construction. Dr. Rea strongly cautions against Smart Meter installation. ⁽²⁾

In his co-authored paper entitled "Electromagnetic and Radiofrequency Field Effect on Human Health" Dr. Rea and his **American Academy of Environmental Medicine** colleagues recommend the following measures:

- **An immediate caution on Smart Meter installation due to potentially harmful RF exposure.** ⁽²⁾
- **Accommodation for health considerations regarding EMF and RF exposure, including exposure to wireless Smart Meter technology.**
- **Independent studies to further understand the health effects from EMF and RF exposure.**
- **Recognition that electromagnetic hypersensitivity is a growing problem worldwide.**

The decades of clinical experience amassed by Environmental Medicine physicians lend a unique perspective into how RF and EMF radiation impacts human health, and could provide a plethora of data and clinical findings from which the Commission may better evaluate the safety profile of Smart Meter emissions pursuant to APS's pending proposal. Amazingly, I cannot find the expert testimony of anyone from this Board medical specialty anywhere in prior proceedings of similar cases. I believe it is incumbent upon the Commission to evaluate this case in light of *all* of the available research from acknowledged experts in their respective fields.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Four

My Story

Our human genetic makeup is so unique that we can now identify a single individual, living or dead, among our entire planet solely by DNA testing. That is because we are biochemically unique. I first encountered the concept of *biochemical individuality* decades ago while undergoing testing and treatment by a local medical doc & surgeon with a Board-specialty in Environmental Medicine. What makes some of us react so poorly and profusely to aspects of our environment such as perfume or cigarette smoke while others appear unaffected? Biochemical Individuality.

Many physicians and researchers believe that Biochemical Individuality determines why certain individuals manifest symptoms from RF emission exposure immediately. I am clearly one of those people.

I have been a Phoenix homeowner for three decades, having lived in my former Phoenix home for 27 years and my new home for 3 years. APS has been my sole electric power provider during that entire period. Last year, unknown to me, APS installed a Smart Meter on my property. After weeks of unexplained headaches and poor sleep, I learned that Smart Meters were installed throughout our community. I immediately contacted APS and advised them of my symptoms and medical history. APS promptly replaced my Smart Meter with a digital meter that does not radiate microwave emissions. Shortly after removal of the Smart Meter, my headaches and sleeplessness diminished and later disappeared altogether. For me, the cause and effect was obvious.

I have a rich medical history including lymphoma and Multiple Chemical Sensitivity (MCS). Although most physicians immediately recognize a cancer diagnosis, MCS is poorly understood and is rarely taught in medical school. In fact, MCS is as poorly understood as electro-sensitivity, that experts believe can be caused by Smart Meters. If you react poorly to either perfume, cigarette smoke, formaldehyde or cleaning products (to name a few) you probably have some form of MCS, which is studied and treated by Board-Certified Environmental Physicians. The leap from MCS to electro-sensitivity is not a great one.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Five

If you cough from errant cigarette smoke when you're in a public place, you can simply walk away. But how can you walk away from a radiating source of microwave energy that is permanently affixed to your home?

Blessing in Disguise

The hidden blessing of individuals who react immediately to Smart Meter emissions is that our obvious symptoms prompt us to identify and isolate the exposure source so that we can take action to remove it. Those persons who are asymptomatic but who are exposed to repeated microwave emissions may indeed develop physiologic changes including end-stage diseases and cancer. ^(1,2) It is akin to internal bleeding but having no symptoms until the damage is severe and irreversible.

Acute & Chronic Radiation Exposure: Are you at Risk?

Smart Meters may pose both acute & chronic exposure risks, including risks from repeated low dose exposure. Dr. Carpenter explains:

"We know after decades of studies of hazardous chemical substances that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than from acute exposure to high concentrations of the same microwaves." ⁽¹⁾

Although there is a steep (logarithmic) signal intensity drop-off as you move further from the radiating source, that is little comfort if the Smart Meter is sited within close proximity to your bedroom, living room, office, kitchen or work area. Common sense tells us not to stand with one's head in proximity to the microwave when you heat your morning coffee. That's not rocket science. If you track Smart Meter emissions within six-feet of the source using an audible, hand-held meter, it will click away like an errant Geiger-counter in some 50's sci-fi drama when encountering nuclear fallout. That's because Smart Meters produce short non-ionizing radiation bursts on an average of 9,600 times a day. It sounds like automatic gunfire. But unlike gunfire, RF waves are non-directional. The emissions do not travel in a straight line but travel in all directions, including through building structures as well as through the entire human body.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Six

Unlike cell phones, which primarily expose the head and neck, Smart Meter radiation targets all organ systems. ⁽²⁾

We are the Experiment

I believe it is incumbent upon the Commission to consider the human health risks identified with Smart Meter non-ionizing radiation exposure as reported by independent experts in their field rather than by paid industry-sponsored spokesmen whose data contains an inherent industry bias.

Absent peer-reviewed empirical data that clearly establish Smart Meter safety-profiles, we become the experiment.

I remind you of the late George Carlin's 1970's "*Hippy-Dippy Weather Man*" comedy skit where while standing in front of a huge weather map and describing an incoming weather front on live TV, Carlin notes that the radar also picked-up a squadron of Russian ICBM.s. Weatherman Carlin then sarcastically quips:

"So don't sweat the thunderstorms."

The Smart Meter's pulsed microwave emissions may well be the Russian ICBM's just now appearing on our radar. And although some parties to this debate advocate the outright dismissal of objective data and decades of clinical experience in favor of cost savings, the potential impact upon public health from Smart Meter emissions is too compelling to ignore.

Forty years ago, mainstream medicine stood steadfast in its proclamation that cigarette smoke did not cause or contribute to lung cancer. Individual scientists and physicians who disagreed at the time committed heresy, often at their personal and professional expense. Today, the cause and effects of smoking is well established. Entire cities ban smoking in public areas. We did the research, evaluated the data, and advised the public so they could make an informed decision on an individual basis. We now need these same rigorous safety profiles applied to Smart Meters. Pending that scientific verdict, we must be able to opt-out now without health or financial penalty. We cannot afford to bet the farm and loose.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Seven

I urge the Commission to please weigh the potentially enormous health impact on Arizona residents that may result from your ruling. We know that a group of respected American physicians and researchers caution that Smart Meter emissions are harmful and needs further study. We know that thousands of citizens in this country alone complain of Smart Meter induced symptoms. Should we ignore the experts and our citizens? Arizona residents with known MCS, electro-sensitivity or with health concerns similar to mine are at special risk and must have a way to opt-out of the utility's installation of a Smart Meter **without financial penalty.**

APS changed the ground rules by installing their Smart Meter after my home purchase. Now APS wants to penalize me and other residents for not accepting a device that leading physicians agree may further compromise my own health and degrade the health of others.

It would be a public *disservice* to allow Arizona Public Service to disrupt the health or finances of any Arizona citizen who chooses to opt-out of a known or suspected health risk. And because it is undisputed that signal density is greatest nearer the source, the location of the Smart Meter sited on any particular owner's property **randomly determines** the dose magnitude. Is your Smart Meter is sited adjacent to any of your living or work areas? Is APS willing to relocate it? What about chronic, low-dose exposure? Is eliminating meter-readers worth the potential health cost?

I respectfully ask the Commission to consider for whom Smart Meters are smart for: Public Health or the Public Utility?

As Dr. Carpenter puts it:

"We are not advocating the abolishment of RF technologies, only the use of common sense, and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards." ⁽²⁾

"Best practices" should include the option to opt out without penalty.

Bob Stump, Chairman
Arizona Corporation Commission
April 17, 2013
Page Eight

Accordingly, I urge the Commission to deny APS's proposal to surcharge its customers who wish to opt-out of Smart Meter installation as it refutes the cautions from experts in the medical field and scientific community who tell us that this type of non-ionizing radiation exposure may be dangerous to human health and in particular to a select population with heightened sensitivity, whether through existing disease or biochemical individuality. Moreover, the cumulative radiation dose received by any resident will fluctuate greatly since the magnitude of Smart Meter emissions is a function of distance, and your meter may be a lot closer to you than mine.

At the very least, while your Commission and our nation debates the merits and safety of Smart Meter installations, current APS customers who resided in their homes prior to the installation of the Smart Meters who choose to opt-out should be grandfathered-in and not penalized in any manner whatsoever since the prior existence of the Smart Meter may have materially impacted any prior decision to purchase or rent.

I do not believe that APS should have the right to force a potentially draconian health or financial decision upon any Arizona resident, no matter what the utility's stated cost savings. If you heeded the manufacture promoted wisdom of the 50's & 60's and smoked a few packs a day, you might not be around today to participate in this debate. The late Marlboro Man can no longer voice his vote. In our collective rush for cost savings through enhanced technology, we sometimes forget about the human cost.

If you share any of the concerns expressed herein, or require more detailed safety data, please vote NO. Better safe now than sorry later.

Respectfully submitted,



George S. Castle

Sources:

1. *Smart Meters: Correcting the Gross Information*, David Carpenter, M.D,
2. *American Academy of Environmental Medicine, Electromagnetic & Radiofrequency Fields: Effect on Human Health*, Multiple Authors.



American Academy of Environmental Medicine

Electromagnetic and Radiofrequency Fields Effect on Human Health

For over 50 years, the American Academy of Environmental Medicine (AAEM) has been studying and treating the effects of the environment on human health. In the last 20 years, our physicians began seeing patients who reported that electric power lines, televisions and other electrical devices caused a wide variety of symptoms. By the mid 1990's, it became clear that patients were adversely affected by electromagnetic fields and becoming more electrically sensitive. In the last five years with the advent of wireless devices, there has been a massive increase in radiofrequency (RF) exposure from wireless devices as well as reports of hypersensitivity and diseases related to electromagnetic field and RF exposure. Multiple studies correlate RF exposure with diseases such as cancer, neurological disease, reproductive disorders, immune dysfunction, and electromagnetic hypersensitivity.

The electromagnetic wave spectrum is divided into ionizing radiation such as ultraviolet and X-rays and non-ionizing radiation such as radiofrequency (RF), which includes WiFi, cell phones, and Smart Meter wireless communication. It has long been recognized that ionizing radiation can have a negative impact on health. However, the effects of non-ionizing radiation on human health recently have been seen. Discussions and research of non-ionizing radiation effects centers around thermal and non-thermal effects. According to the FCC and other regulatory agencies, only thermal effects are relevant regarding health implications and consequently, exposure limits are based on thermal effects only.¹

While it was practical to regulate thermal bioeffects, it was also stated that non-thermal effects are not well understood and no conclusive scientific evidence points to non-thermal based negative health effects.¹ Further arguments are made with respect to RF exposure from WiFi, cell towers and smart meters that due to distance, exposure to these wavelengths are negligible.² However, many *in vitro*, *in vivo* and epidemiological studies demonstrate that significant harmful biological effects occur from non-thermal RF exposure and satisfy Hill's criteria of causality.³ Genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system

dysfunction, cognitive effects, protein and peptide damage, kidney damage, and developmental effects have all been reported in the peer-reviewed scientific literature.

Genotoxic effects from RF exposure, including studies of non-thermal levels of exposure, consistently and specifically show chromosomal instability, altered gene expression, gene mutations, DNA fragmentation and DNA structural breaks.⁴⁻¹¹ A statistically significant dose response effect was demonstrated by Maschevich *et al.*, who reported a linear increase in aneuploidy as a function of the Specific Absorption Rate(SAR) of RF exposure.¹¹ Genotoxic effects are documented to occur in neurons, blood lymphocytes, sperm, red blood cells, epithelial cells, hematopoietic tissue, lung cells and bone marrow. Adverse developmental effects due to non-thermal RF exposure have been shown with decreased litter size in mice from RF exposure well below safety standards.¹² The World Health Organization has classified RF emissions as a group 2 B carcinogen.¹³ Cellular telephone use in rural areas was also shown to be associated with an increased risk for malignant brain tumors.¹⁴

The fact that RF exposure causes neurological damage has been documented repeatedly. Increased blood-brain barrier permeability and oxidative damage, which are associated with brain cancer and neurodegenerative diseases, have been found.^{4,7,15-17} Nittby *et al.* demonstrated a statistically significant dose-response effect between non-thermal RF exposure and occurrence of albumin leak across the blood-brain barrier.¹⁵ Changes associated with degenerative neurological diseases such as Alzheimer's, Parkinson's and Amyotrophic Lateral Sclerosis (ALS) have been reported.^{4,10} Other neurological and cognitive disorders such as headaches, dizziness, tremors, decreased memory and attention, autonomic nervous system dysfunction, decreased reaction times, sleep disturbances and visual disruption have been reported to be statistically significant in multiple epidemiological studies with RF exposure occurring non-locally.¹⁸⁻²¹

Nephrotoxic effects from RF exposure also have been reported. A dose response effect was observed by Ingole and Ghosh in which RF exposure resulted in mild to extensive degenerative changes in chick embryo kidneys based on duration of RF exposure.²⁴ RF emissions have also been shown to cause isomeric changes in amino acids that can result in nephrotoxicity as well as hepatotoxicity.²⁵

Electromagnetic field (EMF) hypersensitivity has been documented in controlled and double blind studies with exposure to various EMF frequencies. Rea *et al.* demonstrated that under double blind placebo controlled conditions, 100% of subjects showed reproducible reactions to that frequency

to which they were most sensitive.²² Pulsed electromagnetic frequencies were shown to consistently provoke neurological symptoms in a blinded subject while exposure to continuous frequencies did not.²³

Although these studies clearly show causality and disprove the claim that health effects from RF exposure are uncertain, there is another mechanism that proves electromagnetic frequencies, including radiofrequencies, can negatively impact human health. Government agencies and industry set safety standards based on the narrow scope of Newtonian or “classical” physics reasoning that the effects of atoms and molecules are confined in space and time. This model supports the theory that a mechanical force acts on a physical object and thus, long-range exposure to EMF and RF cannot have an impact on health if no significant heating occurs. However, this is an incomplete model. A quantum physics model is necessary to fully understand and appreciate how and why EMF and RF fields are harmful to humans.^{26,27} In quantum physics and quantum field theory, matter can behave as a particle or as a wave with wave-like properties. Matter and electromagnetic fields encompass quantum fields that fluctuate in space and time. These interactions can have long-range effects which cannot be shielded, are non-linear and by their quantum nature have uncertainty. Living systems, including the human body, interact with the magnetic vector potential component of an electromagnetic field such as the field near a toroidal coil.^{26,28,29} The magnetic vector potential is the coupling pathway between biological systems and electromagnetic fields.^{26,27} Once a patient’s specific threshold of intensity has been exceeded, it is the frequency which triggers the patient’s reactions.

Long range EMF or RF forces can act over large distances setting a biological system oscillating in phase with the frequency of the electromagnetic field so it adapts with consequences to other body systems. This also may produce an electromagnetic frequency imprint into the living system that can be long lasting.^{26,27,30} Research using objective instrumentation has shown that even passive resonant circuits can imprint a frequency into water and biological systems.³¹ These quantum electrodynamic effects do exist and may explain the adverse health effects seen with EMF and RF exposure. These EMF and RF quantum field effects have not been adequately studied and are not fully understood regarding human health.

Because of the well documented studies showing adverse effects on health and the not fully understood quantum field effect, AAEM calls for exercising precaution with regard to EMF, RF and general frequency exposure. In an era when all society relies on the benefits of electronics, we must find ideas and technologies that do not disturb bodily function. It is clear that the human body uses electricity from the chemical bond to the nerve impulse and obviously this orderly sequence can be

disturbed by an individual-specific electromagnetic frequency environment. Neighbors and whole communities are already exercising precaution, demanding abstention from wireless in their homes and businesses.

Furthermore, the AAEM asks for:

- An immediate caution on Smart Meter installation due to potentially harmful RF exposure.
- Accommodation for health considerations regarding EMF and RF exposure, including exposure to wireless Smart Meter technology.
- Independent studies to further understand the health effects from EMF and RF exposure.
- Recognition that electromagnetic hypersensitivity is a growing problem worldwide.
- Understanding and control of this electrical environmental bombardment for the protection of society.
- Consideration and independent research regarding the quantum effects of EMF and RF on human health.
- Use of safer technology, including for Smart Meters, such as hard-wiring, fiber optics or other non-harmful methods of data transmission.

Submitted by: Amy L. Dean, DO, William J. Rea, MD, Cyril W. Smith, PhD, Alvis L. Barrier, MD

Smart Meters: Correcting the Gross Misinformation



Details

Category: [Position Statements](#)

Smart Meters: Correcting the Gross Misinformation

<http://maisonsaine.ca/smart-meters-correcting-the-gross-misinformation/>

[agfauteux](#) | 11 juillet 2012 |

Quebec-based magazine *La Maison du 21e siecle* asked physician **David O. Carpenter**, former founding dean of the University at Albany (NY)'s School of Public Health, to comment on a letter published in the Montreal daily *Le Devoir* last May 24. This letter claimed wireless smart meters pose no risk to public health. Some forty international experts contributed to the following rebuttal.

We, the undersigned are a group of scientists and health professionals who together have coauthored hundreds of peer-reviewed studies
(photo, see link above for original article)

Dr David O. Carpenter, founder, University at Albany (NY) School of Public Health

on the health effects of electromagnetic fields (EMFs). We wish to correct some of the gross misinformation found in the [letter regarding wireless "smart" meters that was published in the Montreal daily Le Devoir on May 24](#). Submitted by a group [Quebec engineers, physicists and chemists](#), the letter in question reflects an obvious lack of understanding of the science behind the health impacts of the radiofrequency (RF)/microwave EMFs emitted by these meters.

The statement that « Thousands of studies, both epidemiological and experimental in humans, show no increase in cancer cases as a result of exposure to radio waves of low intensity... » is [false \(1\)](#). In fact, [only a few such studies — two dozen case-control studies of mobile phone use](#), certainly not thousands, have reported no elevations of cancer, and most were funded by the wireless industry. In addition, these reassuring studies contained significant experimental design flaws, mainly the fact that the populations followed were too small and were followed for a too short period of time.

Non industry-funded studies have clearly demonstrated a significant increase in cancer cases among individuals who have suffered from prolonged exposure to low-level microwaves, transmitted notably by radio antennas. The effects were best documented in meta-analyses that have been published and that include grouped results from several different studies: [these analyses](#) consistently showed an [increased risk of brain cancer among regular users of a cell phone who have been exposed to microwaves for at least ten years](#).

Brain Cancer Rates

Furthermore, the argument that brain cancer rates do not indicate an overall increase in incidence is not evidence that cell phones are safe: the latency for brain cancer in adults after environmental exposure can be long, up to 20-30 years. Most North Americans haven't used cell phones extensively for that long. The evidence of the link between long-term cell phone use and brain cancer comes primarily from Northern Europe, where cell phones have been commonly used since the 1990s.

Children are especially at risk. In May 2012, the [U.K.'s Office of National Statistics](#) reported a [50 percent increase in incidence of frontal and temporal lobe tumors in children between 1999 and 2009](#). This statistic is especially disturbing since in May 2011, after reviewing the published scientific literature regarding cancers affecting cell phone users, [the International Agency for Research on Cancer \(IARC\) classified radiofrequency radiation as a 2B, possible human carcinogen](#). Despite the absence of scientific consensus, the evidence is sufficiently compelling for any cautious parent to want to reduce their loved one's exposure to RF/microwave emissions as much as possible, as recommended by [various countries](#) such as [Austria](#), [Belgium](#), [Germany](#), [Russia](#) and the [United Kingdom](#).

Electrosensitivity

Public fears about wireless smart meters are well-founded. They are backed by various medical authorities such as the Public Health Departments of [Santa Cruz County](#) (California) and of Salzburg State (Austria). These authorities are worried about the growing number of citizens who say they have developed electrohypersensitivity (EHS), especially since for many of them, the symptoms developed after the installation of such meters (it takes some time for most people to link the two events).

Since the turn of the millennium, people are increasingly affected by ambient microwaves due to the growing popularity of wireless devices such as cell phones and Wi-Fi Internet. Therefore, the mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios without their consent. According to seven surveys done in six European countries between 2002 and 2004, about 10% of Europeans have become electrosensitive, and experts fear that percentage could reach 50% by 2017. The most famous person to publicly reveal her electrosensitivity is Gro Harlem Brundtland, formerly Prime Minister of Norway and retired Director of the World Health Organization (WHO).

While there is no consensus on the origins and mechanisms of EHS, many physicians and other specialists around the world have become aware that EHS symptoms (neurological dermatological, acoustical, etc.) seem to be triggered by exposure to EMF levels well below current international exposure limits, which are established solely on short-term thermal effects (2). Organizations such as the Austrian Medical Association and the American Academy of Environmental Medicine have recognized that the ideal way to treat of EHS is to reduce EMF exposure.

Therefore, caution is warranted because the growing variety of RF/microwave emissions produced by many wireless devices such as smart meters have never been tested for their potential biological effects.

Well-known bioeffects

While the specific pathways to cancer are not fully understood, it is scientifically unacceptable to deny the weight of the evidence regarding the increase in cancer cases in humans that are exposed to high levels of RF/microwave radiation.

The statement that « there is no established mechanism by which a radio wave could induce an adverse effect on human tissue other than by heating » is incorrect, and reflects a lack of awareness and understanding of the scientific literature on the subject. In fact, more than a thousand studies done on low intensity, high frequency, non-ionizing radiation, going back at least fifty years, show that some biological mechanisms of effect do not involve heat. This radiation sends signals to living tissue that stimulate biochemical changes, which can generate various symptoms and may lead to diseases such as cancer.

Even though RF/microwaves don't have the energy to directly break chemical bonds, unlike ionizing radiation such as X-rays, there is scientific evidence that this energy can cause DNA damage indirectly leading to cancer by a combination of biological effects. Recent publications have documented the generation of free radicals, increased permeability of the blood brain barrier allowing potentially toxic chemicals to enter the brain, induction of genes, as well as altered electrical and metabolic activity in human brains upon application of cell phone RF/microwaves similar to those produced by smart meters.

These effects are cumulative and depend on many factors including RF/microwave levels, frequency, waveform, exposure time, biovariability between individuals and combination with other toxic agents. Clear evidence that these microwaves are indeed bioactive has been shown by the fact that low-intensity EMFs have proven clinically useful in some circumstances. Pulsed EMFs have long been used to successfully treat bone fractures that are resistant to other forms of therapy. More recently, frequency-specific, amplitude-modulated EMFs have been found useful to treat advanced carcinoma and chronic pain.

High frequency EMFs such as the microwaves used in cell phones, smart meters, Wi-Fi and cordless "DECT" phones, appear to be the most damaging when used commonly. Most of their biological effects, including symptoms of electrohypersensitivity, can be seen in the damage done to cellular membranes by the loss of structurally-important calcium ions. Prolonged exposure to these high frequencies may eventually lead to cellular malfunction and death.

Furthermore, malfunction of the parathyroid gland, located in the neck just inches from where one holds a cell phone, may actually cause electrohypersensitivity in some people by reducing the background level of calcium ions in the blood. RF/microwave radiation is also known to decrease the production of melatonin, which protects against cancer, and to promote the growth of existing cancer cells.

Early warning scientists attacked

In recommending that the Precautionary Principle be applied in EMF matters, the European Environment Agency's Director Jacqueline McGlade wrote in 2009: "We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that 'early warning' scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It would be surprising if this is not already a feature of the present EMF controversy... » Such unfortunate consequences have indeed occurred.

The statement in the *Le Devoir* letter that « if we consider that a debate should take place, it should focus exclusively on the effects of cell phones on health » is basically an acknowledgement that there is at least some reason to be concerned about cell phones. However, while the immediate exposure from a cell phone is of much greater intensity than the exposure from smart meters, cell phone use is temporary.

Smart meters

Wireless smart meters typically produce atypical, relatively potent and very short pulsed RF/microwaves whose biological effects have

never been fully tested. They emit these millisecond-long RF bursts on average 9,600 times a day with a maximum of 190,000 daily transmissions and a peak level emission two and a half times higher than the stated safety signal, as the California utility Pacific Gas & Electric recognized before that State's Public Utilities Commission. Thus people in proximity to a smart meter are at risk of significantly greater aggregate exposure than with a cell phone, not to mention the cumulative levels of RF/microwaves that people living near several meters are exposed to.

People are exposed to cell phone microwaves primarily in the head and neck, and only when they use their device. With smart meters, the entire body is exposed to the microwaves, which increases the risk of overexposure to many organs.

In addition to these erratic bursts of modulated microwaves coming from smart meters that are transferring usage data to electric, gas and water utilities, wireless and wired smart (powerline communication) meters are also a major source of "dirty electricity" (electrical interference of high frequency voltage transients typically of kilohertz frequencies). Indeed, some scientists, such as American epidemiologist Sam Milham, believe that many of the health complaints about smart meters may also be caused by dirty electricity generated by the « switching » power supply activating all smart meters. Since the installation of filters to reduce dirty electricity circulating on house wiring has been found to relieve symptoms of EHS in some people, this method should be considered among the priorities aimed at reducing potential adverse impacts.

Rather be safe than sorry

The apparent adverse health effects noted with smart meter exposure are likely to be further exacerbated if smart appliances that use wireless communications become the norm and further increase unwarranted exposure.

To date, there have been few independent studies of the health effects of such sources of more continuous but lower intensity microwaves. However, we know after decades of studies of hazardous chemical substances, that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than an acute exposure to high concentrations of the same microwaves.

This is why so many scientists and medical experts urgently recommend that measures following the Precautionary Principle be applied immediately — such as using wired meters — to reduce biologically inappropriate microwave exposure. We are not advocating the abolishment of RF technologies, only the use of common sense and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards.

1. Scientific papers on EMF health effects
2. Explanation and studies on electrosensitivity
3. Governments and organizations that ban or warn against wireless technology

- David O. Carpenter, MD, Director, Institute for Health & the Environment, University at Albany, USA
- Jennifer Armstrong, MD, Past President, Canadian Society of Environmental Medicine, Founder, Ottawa Environmental Health Clinic, Ontario, Canada
- Pierre L. Auger, M. D., FRCPC, Occupational medicine, Multiclinique des accidentés 1464, Montreal, Quebec, Canada
- Fiorella Belpoggi, Director Cesare Maltoni Cancer Research Center, Ramazzini Institute, Bologna, Italy
- Martin Blank, PhD, former President, Bioelectromagnetics Society, Special Lecturer, Department of Physiology and Cellular Biophysics, Columbia University Medical Center, New York, USA
- Barry Breger, MD, Centre d'intégration somatosopique (orthomolecular medicine), Montreal, Quebec
- John Cline, MD, Professor, Institute for Functional Medicine, Federal Way, WA, USA, Medical Director, Cline Medical Centre, Nanaimo, BC, Canada
- Alvaro Augusto de Salles, PhD, Professor of Electrical Engineering, Federal University of Rio Grande do Sul, Porto Alegre, Brazil
- Christos Georgiou, Prof. Biochemistry, Biology Department, University of Patras, Greece
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THE DR. CARLOS SOSA M.D. STORY

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(physician and surgeon) and I'm presently living in Medellin,