

Lita Mousicos  
and  
Roy Cumming  
Met. Ed

C- 2019-3002989  
C 2019-3002995

~~Motion to quash Respondents' Motion to  
Compel as Complainants have responded to  
the past-discovery interrogatories in  
compliance with PA 52 Code 5.349.~~

1) Respondents unctuously invoked PA Code  
5.349 and violated the statute.  
PA 52 code 5.349 states that the  
party upon whom the request is served  
shall serve a written response within  
ten days for rate proceedings and twenty  
days after service of the request for all  
other cases.

The grammatically and spelling-challenged  
Tom Giesler violated the code in demand  
Responses three and five days respectively.  
Furthermore, Giesler knows that

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PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

(2)

Liza Mousios

and

Roy Cummins

Met Ed

Discovery ended in September 2019, these are the types of spurious and scurrilous tactics we have come to expect from Respondents.

Complainants responded to the post-Discovery interrogatories in fewer than the allowable 30 days.

Nonetheless submitted,

Liza Mousios February 11, 2020

Roy Cummins

*[Signature]*

*[Signature]*

2/11/2020

*[Signature]*

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PA PUC  
SECRETARY'S BUREAU

Ray Cummins  
and  
Liza Mouscos  
v.

C 2019-3007989

C 2019-3007995

Met Ed

## Addendum to Brief of Complainants

It should be noted as an appealable and actionable error of law that Judge Keep has not only violated her agreement of January 8, 2000 that the hearing would be conducted in writing; she still adheres to the above mentioned telephone conference on March 30, 2000 despite her superior Judge Pell's GRANT that expert witness Bill Bathgate's expert testimony (by affidavit) would be extended to April 2000 after the duplicious phone hearing. This is further evidence of Judge Keep's fervor to deny complainants preservation of issues on appeal - also notwithstanding

(2)

Complainants' Motion to Keep regarding same

The dangers of smart meters are SETTLED SCIENCE. Yet the PUC and Met Ed rabidly deny the World Health Organization which has classified such technology as a class 2B carcinogen, and which recognizes electromagnetic sensitivity. There is a plethora of scientific and medical documentation confirming

the dangers of smart meters. Yet PUC and the utility companies expect us to be human collateral in their unadmitted evil and greed. (See exhibits).

The adjacent smart meter has sickened Mr. Cummins per his prostate health whereby he was increasingly healthy pre-smart meter. The smart meter has killed and sickened Ms. Mousias' dogs with

(3)

\$ 3,161.00 in veterinary bills.

Ms. Mousias was forced to be homeless with EXTREME loss of her health and symptoms never before experienced from the adjacent smart meter.

BUT WE ARE JUST SUPPOSED TO TAKE IT AND JUDGE WEEP IS A WILLING INCRUSTIOUS PROponent OF THE SMART METERS TO OUR DETRIMENT.

The Daubert Standard is applicable because there are federal violations such as the Americans with Disabilities Act in deploying smart meters. Furthermore

(4)  
invocation of the FCC is a federal  
pursuer. (Various states have adopted  
the Daubert standard).

The standard emanates from the  
Supreme Court case, Daubert v. Merrell  
Dow Pharmaceuticals Inc. 509 U.S.  
579 (1993).

In Kumho Tire v. Carmichael  
526 U.S. 137 (1999) the Supreme Court  
further clarified that the Daubert  
factors may apply to non-scientific  
testimony, meaning "the testimony of  
engineers and other experts who are  
not scientists". This means Bill Bathgate's  
testimony must be considered, despite  
Heep's relentless sabotage of his  
pending testimony, worthy of Judicial  
Review of Judge Heep which is  
imminent.

(5)

The Daubert Standard is the standard used by a judge to assess whether an expert witness's scientific testimony is based on scientifically valid reasoning that which can properly be applied to the facts at issue.

Concomitantly, Ms. Mouscos' physician should naturally have more scientific and medical bearing than a hired reprobate i.e. Mark Israel, who has a venal greed incentive in pretending the smart meters are safe.

Ms. Mouscos' life has been destroyed by the adjacent smart meter; Mr. Cummins is suffering as well.

In her exhaustive study, Dr. Fedencia Lamech wrote of the extreme suffering experienced by victims of the smart meters, with various victims forced into homelessness like Ms. Mouscos.

Dr. Lamech writes, "Interestingly, the vast majority of Victorian cases did not state that they had been sufferers of electromagnetic hypersensitivity syndrome (EHS) prior to exposure to the wireless meters, which points to the possibility that smart meters may have unique characteristics that lower people's thresholds for symptom development. (Altern Ther Health Med, 2014; 20(6): 28-39.)"

While Ms. Mousias was aware of a degree of electromagnetic hypersensitivity prior to exposure to the adjacent smart meter, the toxicity from the smart meter has made her life nearly unbearable, whereas she could tolerate WiFi exposure ~~pre-smart meter~~, now she becomes violently ill from WiFi exposure such as ear pain and increased ringing, ~~already~~ <sup>acute</sup> breast pain by smart meter exposure.

and painful dyesthesias of the arms.  
The "expert" witnesses of the Respondents  
and the utility companies have been known  
to falsify data regarding the lack of  
smart meter safety - even pretending  
a usage chart for electricity was  
a safety graph. This type of  
chicanery could be easily refuted by  
Complainants' expert witness Bill Bathgate  
if Judge Deep were not so fervent  
in his efforts to extirpate complainants'  
rights to due process.

But of course we have no rights. In  
fact, in *Haas v. PUC*, the premise is that  
Pennsylvanians are expected to be subjected  
to dangerous radiation by the PUC in  
violation of their basic rights.

In fact, Title 66/1501 states  
that electric service is to be  
SAFE and REASONABLE. There is  
nothing safe nor reasonable in

8  
the destruction of Ms. Mousios' health,  
her forced homelessness, the death and  
sickness of her dogs and the rapid  
degeneration of Mr. Cummings' health  
post-smart meter.

The hired whores proclaim they know  
more than complainants' own physicians.  
See Exhibit

They impute, no doubt, Ms. Mousios'  
forced homelessness to some sort of  
mental illness, despite Ms. Mousios having  
lived happily in the same house predominately  
since 1996. There is no psychiatric  
label or diagnosis for ~~...~~ being  
forced to live in one's car, a tent or  
a shed [like <sup>smart meter</sup> victims in Pennsylvania and  
Australia] when one had a happy and  
comfortable home. [See Dr. Kracht  
exhibit].

Ms. Mousios lives under cold and  
opprobrious conditions and

desperately wishes she could return to her home! But evil prevails with the depraved 'mandate', a misinterpretation of Act 129.

There is incontrovertible temporal association with the smart meter next door from Mr. Cummins, with many of Ms. Mouscos' symptoms improving away from the meter. Ms. Mouscos ~~NEVER~~ had heart, lung or vomiting blood issues these were the result of the diabolical smart meter. Some symptoms have not improved, such as the increased pain upon exposure to WPI for example. But Ms. Mouscos is just human collateral in the venal and depraved reciprocity between PUC and the utility companies. It should be noted that the surviving dogs' health improved dramatically from being away from the smart meter.

(10)

On two occasions Ms. Mousios became extremely ill and experienced stabbing chest pains when she had no way of knowing that smart meters had been installed. For example, she had gone to the same garage for decades without incident. She became ill with chest pains and difficulty breathing with nausea. She went outside for air and observed the recently installed smart meter.

The hired whores frequently unprovokedly argue that it is power of suggestion as to why complainants are sickened by the smart meter. This is refuted by the above example and another example.

Ms. Mousios starting having chest pains in Upper Black Body, Pa. Upon examination, she saw that smart meters had been installed. This was before the adjacent meter had been installed. She also experienced difficulty breathing and vomited on this occasion. At her former home, after the adjacent meter was installed, she began vomiting blood.

(11)  
Ms. Mousios' dogs' death and sicknesses  
and improvement upon being away from the  
smart meter cannot be ascribed to  
"power of suggestion".

Ms. Mousios was aware of the large  
trajectory of radiation and conducted  
emissions from the mesh technology.  
So she was surprised when an installed  
smart meter down the road did not  
seem to adversely affect her.

This flies in the face of the  
venal expert witness typical, hackneyed  
argument that we are all delusional in  
thinking the smart meters are harming us.  
Ms. Mousios believed the smart meter  
down the road would adversely affect  
her and it did not seem to - not until  
the adjacent meter was installed, which  
had an extremely deleterious effect.

We cannot win. At least Judge Keep can be reviewed for multiple abdication of her duties by the Judicial Review Board.

But we cannot prevail. There is too much obscene solipsistic reciprocity among the PJC, Judge Keep and Met Bd.

These are the same people who would most likely inveigh against Syrian Assad gassing his own people, but Pennsylvanians are being denied their basic constitutional rights, including Mr. Cummins and Ms. Mousios. We are being subjected to the health dangers of this paradigm of moral turpitude and evil. We have no rights. This is a violation of the Americans with Disabilities Act.

February 11, 2020  
Liza Mousios  
Roy Cummins

2/11/2020  
Roy Cummins

Homelessly Submitted

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# Self-Reporting of Symptom Development From Exposure to Radiofrequency Fields of Wireless Smart Meters in Victoria, Australia: A Case Series

Federica Lamech, MBBS

## ABSTRACT

**Context** • In 2006, the government in the state of Victoria, Australia, mandated the rollout of smart meters in Victoria, which effectively removed a whole population's ability to avoid exposure to human-made high-frequency nonionizing radiation. This issue appears to constitute an unprecedented public health challenge for Victoria. By August 2013, 142 people had reported adverse health effects from wireless smart meters by submitting information on an Australian public Web site using its health and legal registers.

**Objective** • The study evaluated the information in the registers to determine the types of symptoms that Victorian residents were developing from exposure to wireless smart meters.

**Design** • In this case series, the registers' managers eliminated those cases that did not clearly identify the people providing information by name, surname, postal address, and/or e-mail to make sure that they were genuine registrants. Then they obtained consent from participants to have their deidentified data used to compile the data for the case series. The author later removed any individual from outside of Victoria.

**Participants** • The study included 92 residents of Victoria, Australia.

**Outcome Measures** • The author used her medical experience and judgment to group symptoms into clinically relevant clusters (eg, pain in the head was grouped with headache, tinnitus was grouped with ringing in the ears). The author stayed quite close to the wording used in the original entries. She then calculated total numbers and percentages for each symptom cluster. Percentages were rounded to the nearest whole number.

**Results** • The most frequently reported symptoms from exposure to smart meters were (1) insomnia, (2) headaches, (3) tinnitus, (4) fatigue, (5) cognitive disturbances, (6) dysesthesias (abnormal sensation), and (7) dizziness. The effects of these symptoms on people's lives were significant.

**Conclusions** • Review of some key studies, both recent and old (1971), reveals that the participants' symptoms were the same as those reported by people exposed to radiofrequency fields emitted by devices other than smart meters. Interestingly, the vast majority of Victorian cases did not state that they had been sufferers of electromagnetic hypersensitivity syndrome (EHS) prior to exposure to the wireless meters, which points to the possibility that smart meters may have unique characteristics that lower people's threshold for symptom development. (*Altern Ther Health Med.* 2014;20(6):28-39.)

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The Victorian Auditor-General's November 2009 report<sup>1</sup> criticized the rollout of smart meters, which had commenced in 2009 under a previous government's mandate from 2006. As a result, a freshly elected Victorian Premier announced in 2010 that his government would review the program. Following a number of reports, including those by Deloitte,<sup>2</sup> EMC Technologies,<sup>3</sup> and Lockstep Consulting,<sup>4</sup> the new Victorian government announced on December 14, 2011, that it would continue with the program. Although the program would result in an overall net cost to consumers of \$319 million dollars (NPV at

2008 values), Deloitte's analysis of the costs and benefits of the program had concluded that it made economic sense to continue given that a large portion of the costs had already been sunk into the project.<sup>2</sup> The rollout was scheduled to conclude by the end of 2013, but the deadline has been extended because of delays caused by technical difficulties, inaccessible sites, and customer refusals.

### Issues Surrounding Rollout

After installation of wireless smart meters began, anecdotes of people developing symptoms started to be reported in mainstream media. For example, an article in the *Herald Sun* in Melbourne reported that Marc and Maureen Florio and their 4 children had left their home, claiming that they had been experiencing constant headaches and sleep deprivation since a neighbor's smart meter had been installed 3 weeks earlier.<sup>3</sup>

Public concerns over a number of issues with the compulsory rollout of smart meters have since intensified and multiplied. They have included (1) adverse health effects; (2) safety issues, such as a possible increased risk of house fires; (3) the incompatibility of the smart meter with existing wiring and appliances, possibly causing damage to electrical devices in the home; (4) privacy issues surrounding the collection and on-selling of vast amounts of data that reveal customers' energy usage patterns; (5) security issues, such as those inherent in any type of wireless communication (ie, a vulnerability to hacking and to cyber-attacks); (6) cost concerns; and (7) a perceived lack of democratic process because of the way in which the rollout had proceeded.<sup>6</sup> In response to these concerns, Energy Safe Victoria (ESV) released a report in July 2012, "Safety of Advanced Metering Infrastructure in Victoria," which stated that "smart meters are safe,"<sup>7</sup> notwithstanding the fact that ESV had mentioned in their draft in May 2012 that the issue of possible health effects was "beyond the detailed scope" of the report.<sup>8</sup>

Victoria's smart meters are electronic meters that are capable of measuring electricity consumption in 30-minute intervals and have a transmitter/antenna that is able to broadcast the collected data wirelessly to the base.<sup>6</sup> Victoria's smart meters also have a second internal antenna for the Home Area Network (HAN) radio, which can be turned on when requested by the customer.<sup>3</sup> The electronic meter is all that is needed to implement time-of-use tariffs (ie, charging different rates for electricity at different times); however, the remote-reading function means that meter readers are no longer required and that the power companies can disconnect and reconnect power remotely.<sup>6</sup> In effect, a smart grid, as opposed to deployment of electronic meters, constitutes the power companies' communication system. The bulk of Victoria's power distributors use wireless mesh networks that rely on the smart meters to act as relay stations, with households' data hopping unpredictably from meter to meter, thus forming a mesh.<sup>6</sup> Any reflective surface can cause a deviation in the transmission route of the radiofrequency signal. One distributor has deployed a WiMax network,

which involves transmission from each meter directly to a collection tower in a star-like configuration.<sup>6,9</sup>

Smart meters do not have to be wireless. Italy has completed the largest smart meter rollout to date. Their smart meters are hard-wired and communicate over the existing power lines.<sup>10</sup> Other options have been proposed, such as communication via telephone lines, whereas fiber optic cabling has already been successfully deployed in other parts of the world.<sup>11</sup> Claims have been made that all types of electronic meters, including wired smart meters, can introduce dirty electricity (ie, high-frequency voltage transients and harmonics) along the wiring of a house, because of their switching-mode power supply, as well as back into the main powerline.<sup>12</sup> The function of the switching-mode power supply is to convert alternating current (AC) coming in from the power lines to direct current (DC), which is required to run the electronic meter. This process creates high frequency voltage spikes, which are emitted constantly, 24/7, and which travel along building wires and radiate outward from them. Critics claim that this dirty electricity can lead to short- and long-term, adverse health effects.<sup>12,13</sup>

### Sources of Radiation

Electromagnetic fields (EMFs) is a broad term that encompasses both natural and human-made sources of radiation. The electromagnetic spectrum describes the continuum of different frequencies put together with the associated wavelength of each frequency.<sup>14,15</sup> The frequency is the number of oscillations or cycles per second, whereas wavelength describes the distance between successive peaks of a wave.<sup>16</sup> As a result, wavelength and frequency are inseparably intertwined: The higher the frequency, the shorter the wavelength is.<sup>14</sup> The electromagnetic spectrum is divided into 2 main types: (1) ionizing radiation, which comprises cosmic and gamma rays, X-rays, and ultraviolet rays; and (2) nonionizing radiation.<sup>14,15,17</sup>

Ionizing radiation has so much energy per quantum that it is able to break chemical bonds between molecules.<sup>14</sup> The negative effect on health of ionizing radiation is well recognized.<sup>17</sup> In this report, however, the term radiation will be used to describe nonionizing radiation, which does not carry sufficient energy to break molecular bonds.<sup>14</sup>

Nonionizing radiation includes (1) extremely low-frequency fields, such as those emitted by electrical appliances and power lines; (2) intermediate-frequency fields, such as those used in some antitheft and security systems; and (3) high-frequency radiation, which includes radiofrequency fields, such as those produced by mobile telephones, television and radio transmitters, and radar, as well as microwaves, a subset of radiofrequency radiation, which have frequencies in the 300 MHz to 300 GHz range.<sup>16</sup> The last are used in microwave ovens and for wireless Internet.<sup>14,15</sup>

These definitions are arbitrary but represent a useful way of describing different parts of the nonionizing component of the spectrum. Discussions of and research on the effects of nonionizing radiation revolve around thermal and

nonthermal effects.<sup>17</sup> According to the main regulatory agencies in Australia and the United States, only thermal effects are capable of affecting human health<sup>17</sup>; however, this article will deal exclusively with the nonthermal, or biological, effects on humans of nonionizing radiation. For this reason, the author has used the terms *radiation*, *radiofrequency*, and *microwaves* interchangeably in this article.

As societies industrialize, an unprecedented increase in the number and diversity of EMF sources occurs.<sup>18</sup> These sources include (1) video display units (VDUs) associated with computers and mobile phones and their base stations,<sup>18</sup> (2) wireless Internet, (3) digital television and radio, and—more recently—(4) wireless utility meters and their associated infrastructure. For some time, individuals have reported a variety of health problems that they relate to exposure to EMF.<sup>18</sup>

### **Electromagnetic Hypersensitivity Syndrome**

Electromagnetic hypersensitivity syndrome (EHS) is characterized by a variety of nonspecific symptoms. The most common ones include dermatological symptoms—redness, tingling, and burning sensations—as well as neurasthenic and vegetative symptoms—fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitations, and digestive disturbances.<sup>18</sup> This syndrome was first described by Russian researchers in the 1950s, who called it microwave sickness.<sup>17</sup>

Although the range of estimates of the EHS prevalence in the general population is broad, a survey of self-help groups has indicated that approximately 10% of reported cases have been considered severe.<sup>18</sup> The World Health Organization (WHO) has expressed a willingness to consider professional and public input on evidence supporting the inclusion of EHS into the 11th version of the International Classification of Diseases (ICD), to be released in 2015.<sup>15</sup> Various national governments have also recognized EHS as an emerging public problem. Sweden classifies EHS as a functional impairment,<sup>15</sup> whereas the Council of Europe Resolution 1815 calls for particular attention to be paid to the needs of electrosensitive people and for the introduction of special measures to protect them, including the creation of wave-free areas not covered by the wireless network.<sup>19</sup>

In May 2013, the author of the current study became aware that people were registering adverse health effects from smart meters on a public Web site. Two ways existed for people to register: (1) a health register and (2) a legal register. The health register requested that people send their data to a specific e-mail address if they believed that their health had been affected following installation of smart meters, asking 2 questions: (1) “Are you hypersensitive to electromagnetic radiation from sources such as smart meters and mobile phones?” and (2) “Has your health been affected following the installation of smart meters?” The legal register contained 1 similarly worded open-ended question: “Do you believe your health has been affected by the installation of smart meters?” If the answer was “yes,” people were asked to

state the symptoms from which they were suffering that they believed had resulted from exposure to electromagnetic radiation (EMR) that had been emitted from smart meters. The information could be submitted online or the form could be printed and filled in by hand, then sent to a designated postal address. Neither form of registration posed direct questions about types of symptoms or offered any form of tick-a-box questionnaire, thereby avoiding the suggestion of various symptoms, and both steered clear of a recruitment-style approach to the collection of information.

The author subsequently approached the managers of the Web site and the registers, and based on her status as a medical practitioner, she received permission to view people's deidentified data in both registers in hard-copy form. It was immediately apparent to the author that people from disparate parts of Victoria were listing the same or similar symptoms from exposure to smart meters. The majority of people could not possibly have known each other, and they certainly had no access to information that had been registered by others, as data sent to the registers had been kept strictly private and confidential. Because the information appeared to point to a new and ongoing public health problem for Victoria, the author decided that a case series report, based on the cases in the registers, was warranted.

### **METHODOLOGY**

The author began by enlisting the agreement and cooperation of the managers of the public Web site and registers and by instructing them on her planned methodology. The managers were given the task of selecting appropriate cases from both their health register and legal register. The cases were included when the managers could clearly identify the person by name, surname, postal address, and/or e-mail address to make sure that they were genuine registrants. In the case of children, name and surname, together with postal address and/or e-mail address of at least 1 parent, were considered sufficient for identification of the child.

The managers then proceeded to print or photocopy each qualifying individual's entry and to deidentify each case, providing the author with each person's gender, date of birth, and the name of his or her residential suburb. The author considered these details important for statistical purposes. Children's symptoms were reported by their parents. E-mail addresses and phone numbers were hidden by the registers' managers, and the author made no attempt to contact any person to obtain additional details or ask for clarification(s). This practice was judged by the author to be appropriate, not only for the maintenance of anonymity but also because any further questioning would have had the potential to introduce biases in reporting and interfere with its spontaneous and unsolicited nature. What was not written or written clearly was simply omitted from the report. This fact must be kept in mind when reading the case series.

The Web site's managers then proceeded to seek signed written consent to use people's deidentified data to compile a report. This request was done by sending a letter to each

individual, mainly via post, but in a few cases in which postal addresses were not available, via e-mail. In the case of children, consent had to be signed by 1 of the parents. One case was drawn directly from the public side of the earlier-mentioned Web site, and for this reason, consent was not sought for that case because it was already available in the public domain. The Web site contained a significant number of publicly available cases of symptoms from smart meters; however, the chosen case was included because it was the only one that provided fully identifiable details: name, surname, residential address, and phone number. The author subsequently removed 1 case from outside the state of Victoria and 1 from a resident of New Zealand.

Of 142 fully identifiable cases before this removal, 91 consented, with the 1 additional case being in the public domain and not requiring consent. Therefore, the sample size was 92, and the author received all deidentified submissions in hard-copy form only. They were stored in her home office under lock and key. The author intends to keep all documents for a period of 5 years after publication of this article. At the end of this period, the documents will be destroyed.

For the results, the author has used her medical experience and judgment to group symptoms into clinically relevant clusters (eg, pain in the head was grouped with headache; tinnitus was grouped with ringing in the ears). The author has stayed quite close to the wording used in the original entries. Total numbers and percentages were calculated for each symptom cluster. Percentage values were rounded to the nearest whole number.

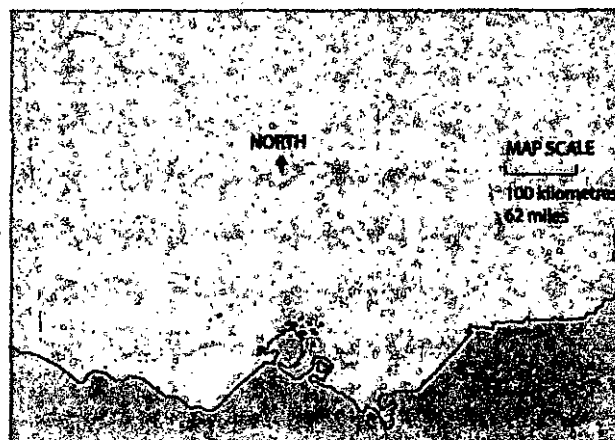
## RESULTS

Of the 92 participants reporting symptoms from exposure to wireless smart meters, 87 were adults and 5 were children. Of the adults, the youngest person was 23 years of age and the oldest was 74; 55 (63%) were female and 32 (37%) were male. The children were aged 6, 10, and 14 years, with the ages of the remaining 2 children unknown. The children's group was composed of 2 females and 3 males. Therefore, for the total group, 57 (62%) were female and 35 (38%) were male.

Of all the individuals, 39 (42%) did not specify whether their symptoms were caused by their neighbors' or their own smart meters. This lack of information was not surprising, because that kind of information was not sought in either the health or the legal registers. Therefore, it is of note that a total of 53 people (58%) volunteered this data: (1) 27 (29%) claimed that their symptoms were from exposure to their neighbors' smart meters, (2) 20 (22%) thought the adverse health effects were from a smart meter at their own homes, and (3) 2 wrote that their symptoms were from both their neighbors' and their own smart meters. It is also interesting that 3 people stated that they experienced symptoms when visiting friends or relatives who had a smart meter, and 1 person became ill after exposure to a smart meter at work.

Only 7 people (8%) stated that they considered themselves to have been suffering from EHS prior to smart meter exposure. Of these, 2 felt that radiation from smart

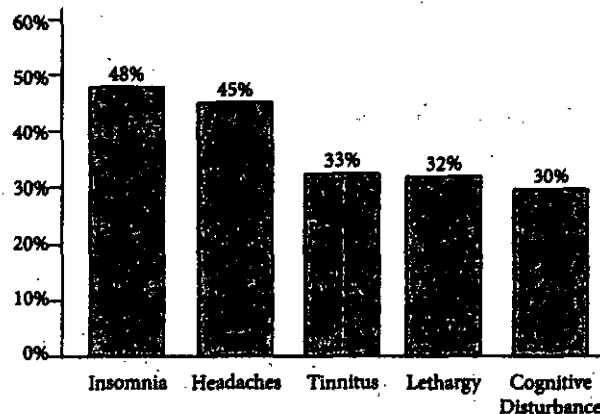
**Figure 1. Map of Victoria and Places of Residence of the People in the Study's Cases**



meters had aggravated their conditions. The place of residence of the person representing each case study was important, because the locations illustrate that individuals reporting symptoms were not concentrated in 1 geographical area but were from different and varied parts of metropolitan and rural Victoria. Figure 1 shows the residential locations of the current study's cases marked with red dots; 67% of the Victorians in this study lived within Melbourne's metropolitan area (ie, Melbourne's suburbs), which is shaded a darker green on the map. This correlates almost perfectly with current demographics for the state, which show more than 70% of all Victorians living in Melbourne's suburbs.

As Figure 2 shows, the most common symptoms were (1) insomnia, sleep disturbance, or sleep disruption—44 people (48%); (2) headaches, head pain, or dull head—41 people (45%); (3) tinnitus, ringing in the ears, or buzzing/noises in the ears—30 people (33%); (4) tiredness, lethargy, or fatigue, including chronic fatigue, exhaustion, or weakness—29 people (32%); and (5) cognitive disturbances, inability to concentrate or think, disorientation, or memory loss—28 people (30%). Table 1 identifies the symptoms that were experienced by participants, other than the 5 most common, with their incidence.

**Figure 2. Five Most Common Symptoms**



**Table 1. Other Symptoms**

Symptom/Symptom Cluster	n (%)
Dysesthesias, including nerve pain, neuropathy, burning sensations, tremors, cold extremities, and poor circulation	20 (22%)
Dizziness/loss of balance	19 (21%)
Heart palpitations	16 (17%)
Nausea	15 (16%)
Onset of EHS	14 (15%)
Pain (in joints, bones, muscles, other and including arthritic changes)	13 (14%)
Pressure/heat/weird feeling in or on head	12 (13%)
Anxiety/agitation/irritability/restlessness	12 (13%)
Adverse health effects not otherwise specified	11 (12%)
Problems with eyes or eyesight/blurred vision	10 (11%)
Chest pain/pain in the heart	9 (10%)
Rashes/skin irritation/skin discoloration/dry skin	7 (8%)
Aggravation of pre-existing medical condition	6 (7%)
Digestive problems/bowel irritability/stomach pain	5 (5%)
Muscle spasms/cramps/twitches	5 (5%)
Nose bleeds	4 (4%)
Ear problems (ear pain, loss of hearing)	3 (3%)
Depression/loss of motivation	3 (3%)
Increased rate of infections/colds	3 (3%)
Allergies/food sensitivities	3 (3%)
Aggravation of EHS	2 (2%)
Sinus problems	2 (2%)
Lump in throat/sore throat	2 (2%)
Weight loss/loss of appetite	2 (2%)
Swollen face/lips	2 (2%)
Bladder infections/strains	2 (2%)
Flu-like symptoms	1 (1%)
Dehydration/thirst	1 (1%)
Weight gain	1 (1%)
Inability to talk	1 (1%)
Loss of motor skills	1 (1%)
Loss of feeling and movement from waist down	1 (1%)

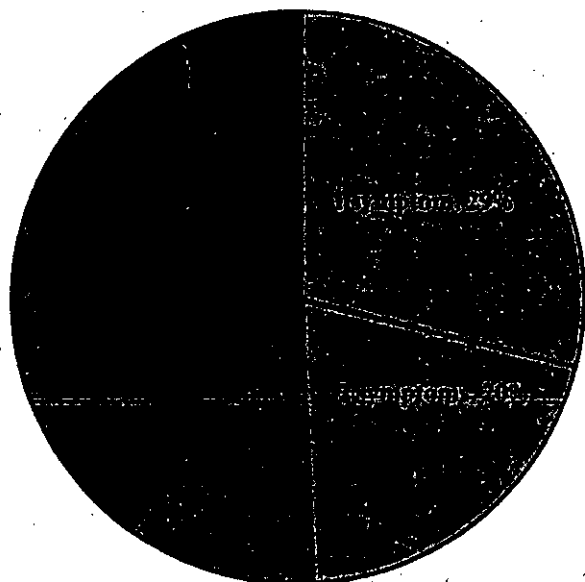
Abbreviations: EHS = electromagnetic hypersensitivity syndrome.

It is concerning that 40% of all participants reported 4 or more symptoms, as this finding is very likely to be predictive of a greater level of disability (Figure 3). Eleven percent had developed only 3 symptoms, 20% only 2 symptoms, and 29% only 1 symptom. Note that the author counted "adverse health effect(s) not otherwise specified" as 1 symptom. She is of the opinion that even 1 symptom, depending on its type and severity, could result in significant disruption for an individual. An example of this result is the experience of the person in Case 82, an adult male who developed only 1

symptom—chronic, severe nerve pain—and had to go on a disability pension as a result.

It may reasonably be expected that a random sample of the population would also report a number of symptoms at any one time, but the difference in these cases is that all people in this study self-reported symptoms that they attributed directly to smart meters. Because EHS is a self-reported syndrome and given the current absence of a reliable assessment tool for identifying EHS in individuals, Eltiti et al<sup>20</sup> concluded that researchers have to rely on the

**Figure 3. Number of Symptoms per Person**



individual's self-diagnosis of their symptoms as caused by exposure to EMF. The researchers proposed an EHS screening tool that is centered on the fact that an individual explicitly attributes his or her symptoms to exposure to EMF-producing object(s).<sup>20</sup>

Similarly, a survey conducted by the Dutch Electrohypersensitivity Foundation in 2007 argues that EMF-affected individuals simply know, often by experimentation, that certain pieces of electrical equipment, installations, or facilities make them sick and that most of the problems are solved when these items are switched off or the EMF exposure is lowered by shielding or increasing the distance from a device.<sup>21</sup> This statement mirrors the experience of the majority of the Victorian cohort, who were specific in their description of their health problems as being directly related to smart meter exposure. A chronological relationship existed between the onset of exposure and symptom development.

A chronological relationship between length of exposure and an increase in the number or severity of symptoms, however, did not necessarily exist. This finding suggested a possible all-or-nothing mechanism, whereby smart meter exposure leads people to reach a personal threshold beyond which adverse health effects are consciously perceived. More than one-half (58%) of all the current participants also volunteered a statement with regard to the location of the smart meter(s) that they had identified as causing their symptom(s) and described clear alleviation of symptom(s) when they moved away from the smart meter(s) or when shielded from the smart meter(s).

As a consequence, a large number of people self-helped either by using shielding measures or by putting distance between themselves and the smart meter(s), which meant either relocating their bedrooms, moving to another residence, ceasing employment, restricting their movement in general, or moving out of the state of Victoria (Table 2).

**Table 2. Effect on People's Lives**

**Effect**

1. Having to go on a disability pension
2. Not being able to use part of one's house
3. Restricting freedom of movement
4. Spending a lot of money on shielding products
5. Causing financial problems
6. Causing relationship problems
7. Having to undergo otherwise unnecessary medical investigations
8. Needing to see a psychologist and doctors
9. Producing general deterioration in quality of life
10. Needing to restrict time spent using a computer
11. Needing to avoid all EMR-emitting devices
12. Being unable to drive
13. Causing secondary stress
14. Having to temporarily move out of one's home while it was being shielded
15. Developing concerns about long-term effects of exposure
16. Relocating bedroom
17. Decreased performance at work
18. Being unable to work
19. Being able to feel normal only when away from home
20. Causing several issues, such as lethargy or cognitive impairment, secondary to sleep disturbances
21. Needing to move into a caravan 25 km out of town
22. Sleeping in a van for 6 months
23. Relocating to another state

Abbreviation: EMR = electromagnetic radiation.

Figure 1 shows that people in this study were from disparate parts of the state of Victoria. They were from metropolitan as well as regional and rural areas and were not concentrated in any geographical area, which makes possible causes of symptoms related to a specific location unlikely (eg, proximity to airports, wind farms, open-cut coal mines, or chemicals used in agriculture). It is also unlikely for the reported symptoms to be associated with any seasonal factor (eg, extremes of temperatures, degree of humidity, bushfire smoke, or a high pollen count), because the reporting period stretched between September 2012 and August 2013, which meant that symptoms were reported during all 4 seasons.

Smart meters represent an ubiquitous presence throughout the state of Victoria, having been rolled out across the entire state. Their presence is not subject to seasonal variation. Therefore, they are a credible possible cause of the symptoms reported in this study, although a case series cannot prove causality. It can and does, however, offer a new hypothesis, one that will have to be tested by further research.

More than one-half (55) of all the cases did not state what effect the symptoms had had on their lives. This lack is possibly caused by the fact that the registration of their symptoms occurred in an open-ended style that did not

directly ask questions other than whether they thought that smart meters had affected their health. Moreover, participants had consented for their deidentified data to be used to compile a report at a time after their initial submission to the Web site's registers. This situation had the benefit of eliminating the likelihood of a real or perceived secondary gain for registrants but also led to the writing of short, simple statements that did not elaborate on how the symptoms had affected their lives. Table 2 provides details about the effect on the lives of the 37 people who made a statement about those effects..

## DISCUSSION

### Biological Effects of Radiation

With regard to the reported symptomatology related to wireless smart meters, it is interesting to look back at a research report by Dr Zorach R. Glaser for the Naval Medical Research Institute (NMRI) in the United States, completed in 1971 and revised in 1972.<sup>22</sup> The report lists in excess of 2300 references on the biological responses to radiofrequency and microwave radiation in its bibliography. What is immediately apparent is the fact that most of the symptoms reported in the current case series were also present in the NMRI report. This fact indicates that biological effects from nonionizing radiation are the same irrespective of the device that emits them—accounting for frequency, intensity, and duration—and that such biological effects were already known and reported to the public in 1971. In fact, Glaser mentions 2 even earlier studies that were both published in 1969.<sup>22</sup> The value of Glaser's report lies particularly in its lack of bias and conflict of interest because the sponsoring department was the Bureau of Medicine and Surgery (Navy) in Washington, DC.

In terms of the biological symptoms listed, an almost complete overlap exists with symptoms reported in the current case series. All commonly reported symptoms in the current case series, such as insomnia, headaches, tinnitus (described as buzzing about the ears in the NMRI document), fatigue, cognitive disturbances, memory problems, dizziness, buzzing in the head, heart rate problems, eye problems, chest pain, dysesthesias, anxiety, and restlessness are very clearly biological symptoms that were listed in Glaser's report,<sup>22</sup> together with less common symptoms, such as heat/weird feeling in/on the head, skin problems, digestive problems, muscle cramps, sinus problems, depression, loss of appetite, and dehydration.<sup>22</sup>

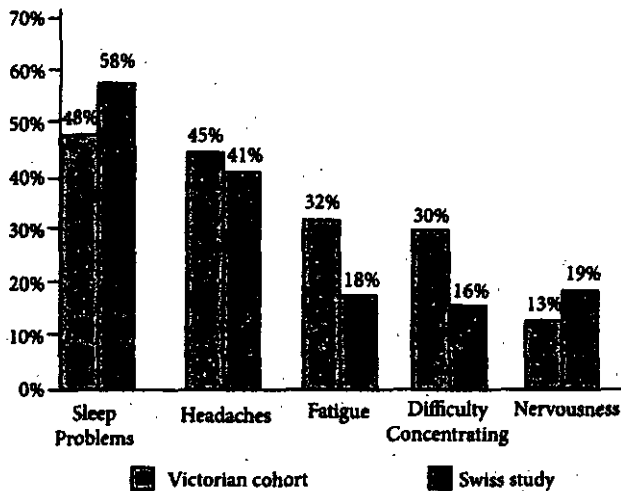
The symptoms reported by Victorians but not mentioned in the 1971 report are (1) nausea; (2) pressure in the head; (3) pain other than head or chest pain, although the pain could be caused by changes in oxidative processes in tissues as listed by Glaser, and consequent tissue inflammation; (4) shortness of breath; (5) ear problems—pain and decreased hearing; (6) allergies and food sensitivities; (7) nose bleeds; (8) increased rate of infections/colds; (9) bladder infections/strains (10) flu-like symptoms; (11) lumps in the throat (the NMRI report instead mentions a peculiar metallic taste in the mouth); (12) swollen face or swollen lips; (13) weight gain; (14) inability to talk, which could be caused by electroencephalogram (EEG)

changes and/or pyramidal tract lesions as mentioned in the 1971 report; and (15) loss of motor skills or loss of feeling and movement from the waist down, which are both consistent with pyramidal tract lesions and effects on locomotor nerves that are listed in the NMRI paper. In looking at these symptoms that were not obviously listed in the NMRI report, it is important to keep in mind that the language of that report was more technical and clinical compared with the current case series, in which the author has purposely stayed true to the wording and terms used by participants and which is, therefore, less technical and less interpretive.

In 1990, a study was commissioned in response to a petition that had been signed by a group of residents in Schwarzenburg, Switzerland, who claimed to be experiencing ill health from a shortwave-radio transmitter present in their small town. The Federal Office of Energy was charged with setting up a study group, which was chaired by Dr J. Cattin, head of the Section Energy Management, and which included the University of Berne and Swiss Telecom, among others.<sup>23</sup> The study was criticized, particularly because of Swiss Telecom's involvement and because of its 5-year duration, which was too short a time for any conclusive findings on long-term health effects, including cancer, to emerge.<sup>24</sup> It nevertheless revealed some impressive understandings on short-term effects from exposure to radiofrequency fields. The most important of these effects was that of sleep disruption, which was very common, affecting 55% of those older than 45 years, and which was directly associated with the electromagnetic-field strength of the transmitter.<sup>23</sup> Other symptoms reported by residents included headaches, tiredness, general weakness, irritability, nervousness, limb pain, lower-back pain, and palpitations. Most important, personality studies were carried out that showed that symptoms were not related to a health-worrying personality but displayed a dose-response relationship with logistic regression. The strong correlation between the type of symptoms experienced by the Victorian cohort and by the residents of Schwarzenburg, together with the shared high prevalence of sleep disruptions in both groups, should further inform assessment of the significance of the findings of the current case series.

A consensus paper of the Austrian Medical Association's EMF Working Group, adopted on March 3, 2012, in Vienna and titled "Guideline of the Austrian Medical Association for the Diagnosis and Treatment of EMF-related Health Problems and Illnesses (EMF Syndrome)," mentions a survey carried out in Switzerland in 2001.<sup>25</sup> In it, 394 respondents attributed specific health problems to EMF exposure. The following symptoms were reported: (1) sleep problems (58%), (2) headaches (41%), (3) nervousness (19%), (4) fatigue (18%), and (5) difficulty concentrating (16%). It is apparent at first glance that the first 2 symptoms are of the same order of frequency as for the Victorians in the current case series (Figure 4). A very similar percentage of people complained of headaches in both the current study (45%) and the Swiss one (41%). A similar, albeit slightly lower, number of participants reported sleep problems, such as insomnia and frequent waking, in Victoria (48%) versus those reported in the Swiss study (58%). All 5 symptoms

**Figure 4. Victorian Cohort Versus Swiss Study**



reported in the Swiss survey corresponded to symptoms experienced by the Victorian cohort, with fatigue (32%) and difficulty concentrating (30%) being more common in Victoria and nervousness (anxiety/agitation) (13%) being less common.

The Austrian Guidelines also list a number of what their authors consider to be EMF-related symptoms: sleep problems, fatigue, exhaustion, lack of energy, restlessness, heart palpitations, muscle and joint pain, headaches, depression, difficulty concentrating, forgetfulness, anxiety, urinary urgency, anomia, dizziness, tinnitus, and a sensation of pressure in the head and the ears.<sup>25</sup> All listed symptoms were experienced by Victorians in the current study, if the reader accepts that anomia corresponds with inability to talk and urinary urgency to bladder infections/strains.

Short-term effects from exposure to radiofrequency fields are also mentioned in another recent publication, the BioInitiative 2012 report prepared by 29 independent scientists and health experts from around the world. It documents bioeffects (ie, adverse health effects) and public health conclusions about effects of nonionizing radiation, including radiofrequency microwave fields. It replaces the BioInitiative 2007 report.<sup>26</sup> These effects involve cognition; memory and learning; behavior; reaction time; attention and concentration; and altered brainwave activity (altered EEG), as well as insomnia; discomfort; loss of well-being; sleep disruption; aberrant immune, allergic, and inflammatory responses in tissues; interference with normal cardiac function; alteration of circadian rhythms; and desynchronization of neural activity that regulates critical functions in the brain, gut, and heart. Radiofrequencies can act as disrupters of synchronized neural activity.

The BioInitiative report offers a detailed explanation on how environmental exposures to artificial EMFs can interact with fundamental biological processes in the human body.<sup>26</sup> This finding should not be unexpected because "human beings are bioelectrical systems."<sup>26</sup> In addition to short-term effects, the report dwells on the long-term sequelae (pathological

**Table 3. Summary of Biological Effects of Nonionizing Radiation**

**Effects**

1. Pathological leakage of the blood-brain barrier, which allows toxins into brain tissues
2. Pathological leakage of the blood-gut barrier
3. Altered immune function, including increased allergic and inflammatory responses
4. Cardiovascular effects, particularly on blood pressure and heart rate
5. Disregulation of circadian rhythms and reduced melatonin production, which may account for insomnia
6. Nervous system effects, which include altered brainwave activity, changes in neuronal functioning and changes in autonomic nervous system electrophysiology
7. Desynchronization of neural activity that regulates critical functions in brain, gut, and heart
8. Lipid peroxidation of cell membranes
9. Elevated intracellular calcium with consequent disruption of cell metabolism
10. Poorly functioning mitochondria
11. Production of stress proteins as a result of the direct interaction of EMF with the DNA molecule, whereby DNA acts as a fractal antenna (because of its coiled-coil configuration)
12. Altered biochemical functions and production of hormones
13. Increased production of free radicals and deficiencies of antioxidants such as glutathione and melatonin leading to oxidative stress

Abbreviation: EMF = electromagnetic field.

conditions) from chronic exposure to nonionizing radiation, which include genotoxicity and DNA breakages among others.<sup>26</sup> It is not strictly within the scope of this case series to explain the biophysical mechanisms that may account for acute symptoms or effects or to discuss the long-term serious health endpoints associated with radiofrequency radiation; however, a summary of the nonthermal biological effects of nonionizing radiation is contained in Table 3. It is distilled from the BioInitiative report and intends to be a basic guide for clinicians.

It also needs to be mentioned that in 2011, the International Agency for Research on Cancer (IARC), which is part of the WHO, classified radiofrequency fields as a Group 2B Possible Human Carcinogen, based on an increased risk of glioma after 10 years or longer of cell phone use.<sup>27</sup> The IARC clarified that the evidence for carcinogenicity applies to exposures to radiofrequency radiation from all sources, not only cell phones (ie, it is not device-specific).<sup>28</sup> This finding has implications for the continued massive rollout of wireless technologies, in particular the wireless smart utility

meter, which was described in a recent statement to the UK Parliament as having triggered thousands of complaints of ill health and disabling symptoms worldwide.<sup>29</sup>

### **Mandated, Involuntary Exposure**

With regard to smart meters, 2 unique features should be considered: (1) exposure may be involuntary and (2) exposure can be universal. In Victoria, smart meters were mandated, thereby removing the individual's choice to avoid exposure in his or her own home, and involuntary exposure also occurred to meters in neighboring homes. Each smart meter in the mesh networks transmits an unknown and variable number of burst transmissions per day, which typically reach into many thousands in number.<sup>30</sup> Meters on the WiMax network,<sup>9</sup> although not communicating with each other and deploying only bidirectional communication between a meter and the base station, nevertheless send hourly time synchronization signals in addition to their daily session transmissions.<sup>3</sup>

A submission by the Public Utilities Commission of California shows that only 45.3 seconds of transmissions per day (<0.1% duty cycle) still equates to 9600 transmissions.<sup>30</sup> Exposures are likely to be physiologically additive in nature.<sup>25,26,31</sup> Moreover, belief is increasing in the concept that intermittent pulses of radiofrequencies, such as those used in the smart grid, are more biologically significant compared with constant-type exposures, even when the time-averaged exposure is miniscule.<sup>26,31</sup> This kind of signal is biologically active and *not* invisible to the human body and its proper biological functioning, because the unpredictable pulses disrupt the synchronized biological oscillations within cells.<sup>26</sup> The Austrian Medical Association recommends that such periodic signals should be critically evaluated, whereas nonperiodic signals may be considered more leniently.<sup>25</sup>

In a 2012 memorandum titled "Health Risks Associated with SmartMeters," Dr Poki Namkung, public health officer of the County of Santa Cruz (CA, USA) stated that no scientific literature exists on the health risks of smart meters because they are a new technology.<sup>31</sup> This statement parallels the Austrian EMF Working Group's statement that "new technologies and applications have been introduced without certainty about their health effects."<sup>25</sup> Dr. Namkung also explains that research on the potential health risks from radiofrequencies has been funded largely by industry because little funding is available for basic scientific research.<sup>31</sup>

The report indicates:

... exposure is additive and consumers may have already increased their exposures to radiofrequency radiation in the home through the voluntary use of wireless devices such as cell and cordless phones, personal digital assistants (PDAs), routers for internet access, home security systems, wireless baby surveillance monitors (baby monitors), and other emerging devices. It would be impossible to know how close a consumer might be to his or her limit, making safety a uncertainty if SmartMeters are mandatorily installed.<sup>31</sup>

Again, this statement correlates with the conclusion in the Austrian Guidelines that "multiple exposures to different EMF sources must be taken into account."<sup>25</sup> Dr Namkung's conclusion that "... governmental agencies are the only defense against such involuntary exposure" to mandated smart meters' nonionizing radiation emissions<sup>31</sup> applies in a particularly relevant way to the Victorian experience.

A similar view is also shared by Dr David O. Carpenter and 53 other scientists and doctors, who, in an article published in 2012, outline some of the effects of EMF exposure with the intent to correct some of the gross misinformation regarding wireless smart meters and advocate for the application of a precautionary principle, such as using wired meters.<sup>32</sup>

Although some of the studies discussed in this report offer recommendations regarding wireless smart meter deployment (Table 4), virtually no published studies are available with respect to smart meters and human health, and no long-term studies exist because of the newness of the technology.

Notably, an early voice of concern on this issue was that of Don Maisch, PhD, from Tasmania, who posed the question of whether smart meters would end up creating a public health nightmare in an article published in September 2012.<sup>33</sup> In it, he explained how current exposure standards are outdated and no longer relevant and warned that, given the sheer number of people exposed, simply dismissing anecdotal evidence of symptoms from smart meters as a nocebo (harmless) effect without a serious research effort would be inexcusable.

### **Incidence of Effects**

This article has discussed the fact that people from various regional and metropolitan areas in the state of Victoria, of all ages and during all seasons, have reported symptoms from exposure to the radiofrequency fields of wireless smart meters as well as the onset or aggravation of EHS and the aggravation of pre-existing medical conditions after installation of the meters. Interestingly, only 8% of the participants in the current study stated that they had suffered from EHS prior to exposure to smart meters, which suggests that the threshold for symptom development appears to be significantly lower when it comes to wireless meters compared with that for other wireless devices.

Of an initial 142 people who had formally registered their adverse health effects from smart meters related to the current study, 92 consented to participation. The author considers this number to be significant and most likely to represent the tip of the iceberg in terms of total numbers. Underestimation could be caused by the fact that people do not associate their symptoms with smart meter exposure when the symptoms are not severe or do not occur concurrently. In addition, this underdiagnosis may be caused by a lack of knowledge about the effects of wireless technologies on the part of the general population and the majority of the medical fraternity. The ongoing campaign of

**Table 4. Summary of Scientific Reports**

Title	Author(s)	Country	Year	Subject Matter and Findings	Recommendations
"Bibliography of Reported Biological Phenomena and Clinical Manifestations Attributed to Microwave and Radio-frequency Radiation"	Glaser <sup>22</sup>	United States	1971	Provides more than 2000 references on the biological responses to radiofrequency radiation	No specific recommendation; prepared for the Naval Medical Research Institute, Bethesda, Maryland; approved for unlimited public release.
"Study on Health Effects of the Shortwave Transmitter Station of Schwarzenburg, Berne, Switzerland"	Altpeter, Krebs, Pflugger, et al <sup>23</sup>	Switzerland	1995	Notes marked deterioration of sleep quality in persons exposed to radio transmitter	No urgent protection measures; review of current exposure guidelines; further research
"Guideline of the Austrian Medical Association for the Diagnosis and Treatment of EMF-related Health Problems and Illnesses (EMF Syndrome)"	Austrian Medical Association's EMF Working Group <sup>24</sup>	Austria	2012	Discusses EMF-related problems and outlines clinical-management approach	Primary method of treatment of EMF-related health problems to consist of prevention or reduction of EMF exposure
"BioInitiative 2012—A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation"	Prepared by 29 experts, edited by Sage & Carpenter <sup>26</sup>	Experts from more than 10 countries	2012	Reviews more than 1800 new scientific studies added to the BioInitiative Report 2007, which cited 2000 studies on adverse health effects from extremely low frequencies and radiofrequencies	New, biologically based public-exposure standard; precautionary approach to RF exposure levels
"Health Risks Associated with SmartMeters"	Namkung <sup>21</sup>	United States	2012	Indicates objective evidence supports EHS diagnosis; no scientific literature on health risks of smart meters	All available, peer-reviewed research data on EMF applicable to smart meters; governmental agencies to protect public health from involuntary exposure
"Smart Meters: Correcting the Gross Misinformation"	Carpenter et al <sup>22</sup>	Authors from a number of countries; published in Canada	2012	Summarizes long-term and short-term health effects of EMF exposure, in particular from smart meters	Application of Precautionary Principle, such as using wired meters
"Electromagnetic and Radiofrequency Fields Effect on Human Health"	Dean, Rea, Smith, Barrier (American Academy of Environmental Medicine) <sup>17</sup>	United States	2012	Discusses different types of radiation and effect of the increasing use of wireless technology on human health	Immediate caution on smart-meter installation; further research on effects of EMF and RF exposure; use of safer technology, including for smart meters

Abbreviations: EMF = electromagnetic field; RF = radiofrequency; EHS = electromagnetic hypersensitivity syndrome.

the state government and power distributors to portray smart meters as safe has also contributed to this lack of knowledge. Even when people believe that their new symptom(s) are caused by smart meters, some are not able to report or register their symptoms because they have no Internet access, and of those who do, not all are aware of Web sites or ways to make reports.

**Limitations of Current Study**

The main limitation of the current study is that, being a case series, it is a descriptive, retrospective study that does not have a control arm and can therefore help formulate a new hypothesis, but can only make limited statements on the causality of correlations observed.

Another limitation, which is specific to this type of noninterventional analysis of existing nonidentifiable data, is that the author was not able to contact individual case studies and was therefore unable to clarify or add to the information given by them. For the same reason, the author was also unable to follow up these cases longitudinally, which is something that could have potentially yielded valuable information.

**CONCLUSIONS**

This case series has discussed the most commonly reported symptoms from wireless smart meters. Although some of these symptoms are also reported in relationship to other environmental exposures, such as proximity to airports

or wind turbines, Victorians in this report claimed a direct chronological association between exposure to wireless smart meters and symptom development. A look at the place of residence of people reporting symptoms does not suggest a link to any possible environmental factors that are geographically specific. Seasonal factors are also excluded, because the reporting period stretched over all 4 seasons. The effect of these symptoms on people's lives is far-ranging, from stress, financial problems, and unnecessary investigations to needing to move out of one's home and even to another state.

The author of the current study offers the hypothesis that some people can develop symptoms from exposure to the radiofrequency fields of wireless smart meters. This hypothesis cannot be disproven without further assessment of the affected individuals and the electromagnetic fields in which they live. An evidence-based approach, such as the one used in all other areas of medicine, must be applied, which would mean the establishment of a postrollout surveillance study and funding for further research into the particular effects of wireless smart meters, in conjunction with research into the short-term and long-term consequences of EMR exposure. Until more knowledge is accumulated and until this type of wireless technology can be proven safe, the author believes that communities should use a cautionary approach, asking for a moratorium on deployment of wireless smart meters and smart grids and for the use of safer technologies for smart meters, such as hard-wiring, fiber optics, or other nonharmful methods of data transmission, including reading of meters by meter readers. Living in a wireless smart grid makes the Austrian Medical Association's recommendation to "take all reasonable measures to reduce exposure to electromagnetic fields" impossible to implement.

Dr Maisch's article title, "Smart Meter Health Concerns: Just a Nocebo (Harmless) Effect or an Emerging Public Health Nightmare?," resonates strongly with the Victorian experience so far. This question is very pertinent and one that must be urgently answered.

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Science  
Systems

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- David J. Blyweiss, M.D., Director of Functional Medicine, Maximum Wellness Centers, Ft. Lauderdale, FL

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[www.stopsmartmeters.org.nz](#)

## Cell Phone Tower Tinnitus

**This is a major public health disaster and has been sent to the following with a request for remedial action.**

- Local Government & Environment Select Committee - 13/10/2009
- Vodafone - 6 Company Representatives - 28/10/2009
- Manukau City Council - Mayor Len Brown - 30/10/2009
- 2 Degrees - 2 Company Representatives - 30/10/2009
- Ministry of Health - Minister Tony Ryall - 30/10/2009
- Local Government & Environment Select Committee - Chair Chris Auchinvole - 3/11/2009
- Ministry of Health - Director General Stephen McKernan - 4/11/2009
- 2 Degrees - CEO Eric Hertz, Chair Bill Osborne - 5/11/2009
- Ministry of Local Government - Minister Rodney Hide - 5/11/2009
- Ministry of Environment - Minister Nick Smith - 5/11/2009

### A Personal Note

Dear Global Friends,

I developed Tinnitus or the ringing of the ears within six weeks of the Cell Phone Tower being installed in front of my home in early 2009. Once measuring equipment arrived we determined that our lounge was in direct line of sight of the Tower and was receiving the highest readings of Microwave Radiation.

I visited an Audiologist at the Auckland University Audiology Clinic. They confirmed that I had recently developed Tinnitus, however my age (30s), excellent health, excellent hearing meant that they were unable to determine the cause. However most people do develop Tinnitus but generally in the 60s and unfortunately it is permanent.

The cause is a well documented Microwave Hearing Effect as detailed in the below studies. I took this all the way up to the Director General of Health. I ended up in contact with the lead scientist on Microwave Hearing who also worked for Motorola. Although the measured power levels were very low for an immediate effect he had not exposed humans to months of Microwave Radiation and therefore could not rule this out as the cause.

To date **40%** of visitors to this site are now reading this page on Tinnitus. You are not alone in your ill health so please add your story to the [Health Register](#) as together we will make a difference.

Regards

T Greening

B.Technology (Information Engineering)

CCDA, CCNA

[info@nes.org.nz](mailto:info@nes.org.nz)

**Tinnitus and mobile phone use - 2010**

<http://www.emf-portal.de/viewer.php?aid=18434&l=e>

Overall, no statistically significant increased risk for mobile phone use and tinnitus was observed in subgroups, **except for the subgroup of ipsilateral use for 4 years and longer (OR 1.95; CI 1.00-3.80)**. The authors concluded that high intensity and long duration of mobile phone use might be associated with tinnitus.

#### **Auditory response to pulsed radiofrequency energy - 2003**

[http://www.ncbi.nlm.nih.gov/pubmed/14628312?](http://www.ncbi.nlm.nih.gov/pubmed/14628312?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed.ResultsPanel.Pub)

[ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed.ResultsPanel.Pub](http://www.ncbi.nlm.nih.gov/pubmed/14628312?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed.ResultsPanel.Pub)

The human auditory response to pulses of radiofrequency (RF) energy, commonly called **RF hearing**, is a well established phenomenon. RF induced sounds can be characterized as low intensity sounds because, in general, a quiet environment is required for the auditory response. The sound is similar to other common sounds such as a click, buzz, hiss, knock, or chirp. Effective radiofrequencies range from 2.4 to 10000 MHz, but an individual's ability to hear RF induced sounds is dependent upon high frequency acoustic hearing in the kHz range above about 5 kHz. The site of conversion of RF energy to acoustic energy is within or peripheral to the cochlea, and once the cochlea is stimulated, the detection of RF induced sounds in humans and RF induced auditory responses in animals is similar to acoustic sound detection. The fundamental frequency of RF induced sounds is independent of the frequency of the radiowaves but dependent upon head dimensions. The auditory response has been shown to be dependent upon the energy in a single pulse and not on average power density. The weight of evidence of the results of human, animal, and modeling studies supports the thermoelastic expansion theory as the explanation for the RF hearing phenomenon. RF induced sounds involve the perception via bone conduction of thermally generated sound transients, that is, audible sounds are produced by rapid thermal expansion resulting from a calculated temperature rise of only  $5 \times 10^{-6}$  degrees C in tissue at the threshold level due to absorption of the energy in the RF pulse. The hearing of RF induced sounds at exposure levels many orders of magnitude greater than the hearing threshold is considered to be a biological effect without an accompanying health effect. This conclusion is supported by a comparison of pressure induced in the body by RF pulses to pressure associated with hazardous acoustic energy and clinical ultrasound procedures. Copyright 2003 Wiley-Liss, Inc.

#### **Microwave Auditory Effect - 2007**

**Hearing of microwave pulses by humans and animals: effects, mechanism, and thresholds.**

<http://www.ncbi.nlm.nih.gov/pubmed/17495664>

The hearing of microwave pulses is a unique exception to the airborne or bone-conducted sound energy normally encountered in human auditory perception. The hearing apparatus commonly responds to airborne or bone-conducted acoustic or sound pressure waves in the audible frequency range. But the hearing of microwave pulses involves electromagnetic waves whose frequency ranges from hundreds of MHz to tens of GHz. Since electromagnetic waves (e.g., light) are seen but not heard, the report of auditory perception of microwave pulses was at once astonishing and intriguing. Moreover, it stood in sharp contrast to the responses associated with continuous-wave microwave radiation. Experimental and theoretical studies have shown that the microwave auditory phenomenon does not arise from an interaction of microwave pulses directly with the auditory nerves or neurons along the auditory neurophysiological pathways of the central nervous system. Instead, the microwave pulse, upon absorption by soft tissues in the head, launches a thermoelastic wave of acoustic pressure that travels by bone conduction to the inner ear. There, it activates the cochlear receptors via the same process involved for normal hearing. Aside from tissue heating, microwave auditory effect is the most widely accepted biological effect of microwave radiation with a known mechanism of interaction: the thermoelastic theory. The phenomenon,

mechanism, power requirement, pressure amplitude, and auditory thresholds of microwave hearing are discussed in this paper. A specific emphasis is placed on human exposures to wireless communication fields and magnetic resonance imaging (MRI) coils.

**Sound perception induced by extracranial magnetic stimulation in deaf patients. - 1992**

[http://www.ncbi.nlm.nih.gov/pubmed/1488610?](http://www.ncbi.nlm.nih.gov/pubmed/1488610?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

[ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubn](http://www.ncbi.nlm.nih.gov/pubmed/1488610?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

Two profoundly hard-of-hearing and deaf patients were examined by non-invasive extracranial magnetic stimulation (EMS) in an effort to determine whether EMS could evoke auditory sensations. The patients were fitted with standard earplugs and were stimulated at the auricle, the mastoid and the temporal lobe area. The threshold of auditory sensation (TAS) was determined at each stimulus position and found to be approximately 20-40% of the maximum EMS level (2.0 Tesla). The TAS was generally lowest in mastoid stimulation, but was variable, and dependent on the angle and position of the stimulating coil relative to the skull. Middle-ear muscle reflex (MEMR) tests performed by EMS of the auricle, mastoid and temporal lobe area contralateral to the probe ear were negative. It was concluded that EMS of the auditory system, particularly the mastoid area, can evoke auditory sensations in cochlea-deaf ears, and that this technique deserves further study as a non-invasive procedure for evaluating potential cochlear implant patients in conjunction with electrostimulation.

**Electromagnetic stimulation of the auditory system: effects and side-effects. - 1993**

[http://www.ncbi.nlm.nih.gov/pubmed/8210963?](http://www.ncbi.nlm.nih.gov/pubmed/8210963?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

[ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubn](http://www.ncbi.nlm.nih.gov/pubmed/8210963?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

Extracranial electromagnetic stimulation (EMS) is a recently developed clinical technique which may be used in place of conventional transcutaneous electrical stimulation to activate the central and peripheral nervous systems. This technique is widely used in neurology and otolaryngology for non-invasive stimulation of the brain and facial nerve. EMS uses electromagnetic field pulses which pass unimpeded through the cranium and soft tissues to activate excitable membranes of volume conductors. In this series of studies, the effects and side-effects of electromagnetic stimulation on the auditory system of humans and experimental animals were investigated. In the first study, 18 profoundly hard-of-hearing and deaf patients who were candidates for cochlear implants were examined by non-invasive EMS in an effort to determine whether EMS could stimulate residual neurons in the cochlea, 8th nerve proper, or higher auditory brain centers, and evoke auditory sensations. The patients were stimulated with a magnetic coil positioned at the (1) auricle, (2) mastoid process, and (3) the temporal lobe area. EMS elicited auditory sensations in 26 ears (of 14 patients/subjects). The lowest threshold of auditory sensation (IAS) at each stimulus position was found to be at the 20% EMS level, with a range of 20-50% of the maximum level (2.0 Tesla), and with equal sensitivity in each coil position.

**Occupational safety: effects of workplace radiofrequencies on hearing function. - 2004**

[http://www.ncbi.nlm.nih.gov/pubmed/15631877?](http://www.ncbi.nlm.nih.gov/pubmed/15631877?ordinalpos=7&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

[ordinalpos=7&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubn](http://www.ncbi.nlm.nih.gov/pubmed/15631877?ordinalpos=7&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubn)

Results of BERA indicated no statistically significant differences between exposure and control subjects. In audiometric evaluation, hearing threshold of people occupationally exposed to RF were found higher than the control group subjects for frequencies of 4000 Hz and 8000 Hz in terms of bone and air conduction of right and left ear ( $p < 0.01$ ). CONCLUSIONS: The results of traditional audiometer indicated that RF promotes sensorineural hearing loss and affects cochlea parts related to 4000 Hz and 8000 Hz. These findings may have immediate implications and considerations for workplace safety in order

to provide an occupationally safe environment to employees working in such settings.

**Microwave auditory effect- a comparison of some possible transduction mechanisms - 1976**

[http://www.ncbi.nlm.nih.gov/pubmed/1046077?ordinalpos=23&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pub](http://www.ncbi.nlm.nih.gov/pubmed/1046077?ordinalpos=23&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pub)

When human subjects are irradiated with pulse modulated microwave energy they report the perception of a sound that appears to originate from within or slightly behind the head. Three of the possible mechanisms are examined using first order mathematical approximations and several simplifying assumptions. The results show that while all three (radiation pressure, striction force and thermal expansion) are capable of producing the phenomenon, the stress resulting from thermal expansion may be so great that it masks the effect of the others completely.



Human\_Auditory\_... Toa Greening, 4 N... v.1



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## CNS Effects - Enzymes



- EMFs modify hydrogen bonds
- Affecting
  - Hippocampus
  - Cholinergic System
  - GABA
- Structural changes to many enzymes
  - Cytochrome p450-reductase
  - AchE – enzyme that catalyzes hydrolysis of acetylcholine. Affects learning and wakefulness

Author-Year	Frequency-Intensity-Time	Model-Effect
Teslyier [2002]	Low intensity EMR.	Rats, modification of the hippocampal cholinergic system.
Bartieri [2005]	EMR exposure.	Structural and biochemical changes in AchE.
Vorobyov [2004]	Repeated exposure to low-level extremely low frequency-modulated EMR	Freely moving rats, baseline and scopolamine-modified EEG.
Mausset [2001]	4 W/kg	Rat, decrease in GABA, an inhibitory transmitter, content in the cerebellum.
Mausset-Bonnefouf [2004]	Acute GSM 900-MHz exposure at 6 W/kg.	Rat brain, changes in affinity and concentration of NMDA and GABA receptors.
Wang [2005]	900 MHz.	Cultured rat hippocampal neurons, changes in GABA receptors and reduced excitatory synaptic activity.
Xu [2006]	GSM 1800-MHz.	Cultured hippocampal neurons, number of excitatory synapses.
Lopez Martin [2006]	GSM signal.	Rats given subconvulsive doses of picrotoxin, a drug that blocks the GABA system, seizure facilitated.
Beason and Semm [2002]	GSM signal.	Birds, increase and decrease in firing rates.

Health Effects of Electromagnetism - McGill Course OCCH-605, January 2019,  
 Dr. Paul Heroux - <http://www.invitroplus.mcgill.ca>

## US Air Force Rome Laboratory – Sleep Effects

### v. Analeptic Effect in Animals

Pulsed RF/MW radiation was reported to have an analeptic effect in laboratory animals. Experimental results presented by R. D. McAfee in 1971 showed that anesthetized animals could be awakened by irradiation from a pulsed 10 GHz RF/MW source. The energy incident on the test animals was estimated to have a power density of between 20-40 mW/cm<sup>2</sup>. Experiments conducted on rats showed that these animals were aroused from states of deep sleep by irradiation. It was observed that the blood pressure of a rat decreased

states of deep sleep by irradiation. It was observed that the blood pressure of a rat decreased simultaneously with the arousal response and that laryngeal spasms would occur when the rat was awakened. McAfee reported that the laryngeal spasms would obstruct the airway causing convulsions, asphyxiation, and eventually death. Other experiments performed on rabbits, cats, and dogs showed that these animals could also be awakened by irradiation.

Animals were aroused from states of deep sleep by irradiation with pulsed RF/MW

sure of the dogs  
al response was  
nature of the  
that the

Bolen, S. M. (1994). Radiofrequency/Microwave Radiation Biological Effects and safety standards: a review (No. RL-TR-94-53). ROME LAB ROME NY.

## Neurologic Effects of RFR/MW 1971 U.S. Naval Report

- Headaches
- Insomnia, restlessness, fatigue
- EEG changes/seizures
- Memory loss
- Cranial nerve disorders
- Sympathetic and parasympathetic N.S. changes
- Depression, impotence, anxiety, irritability, anorexia, dizziness
- Insomnia, hallucinations

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BIBLIOGRAPHY OF REPORTED BIOLOGICAL PHENOMENA ('EFFECTS') AND CLINICAL MANIFESTATIONS ATTRIBUTED TO MICROWAVE AND RADIO-FREQUENCY RADIATION

Zorach R. Glaser, Ph.D.  
LT, MSC, USNR



BIBLIOGRAPHY OF REPORTED BIOLOGICAL PHENOMENA ('EFFECTS') AND CLINICAL MANIFESTATIONS ATTRIBUTED TO MICROWAVE AND RADIO-FREQUENCY RADIATION

RESEARCH REPORT

MF12.524.015-0008

USPC NO. 2  
1971E

NATIONAL TECHNICAL INFORMATION SERVICE

Glaser, Z. (1971). Bibliography of reported biological phenomena ('effects') and clinical manifestations attributed to microwave and radiofrequency radiation. Naval Medical Research Institute Research Report Project MF12.524.015-0008B. Res. Inst., Nat. Naval Med. Center, Bethesda, Md.

From: PA SafeTech pasafetech@gmail.com  
 Subject: Papers  
 Date: January 10, 2020 at 8:13 AM  
 To: Liza Mousios cumming@epix.net



Radiofrequency radiation emitted from Wi-Fi (2.4 GHz) causes impaired insulin secretion and increased oxidative stress in rat pancreatic islets

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Masoumi, A., Karbalaee, N., Mortazavi, S., & Shabani, M. (2018). Radiofrequency radiation emitted from Wi-Fi (2.4 GHz) causes impaired insulin secretion and increased oxidative stress in rat pancreatic islets. *International Journal of Radiation Biology*, 94(9), 850-857.

ABSTRACT

**Purpose:** There is a great concern regarding the possible adverse effects of electromagnetic radiation (EMR). This study investigated the effects of EMR induced by Wi-Fi (2.45 GHz) on insulin secretion and antioxidant redox systems in the rat pancreas.

**Materials and methods:** Adult male Sprague-Dawley rats in the weight range of 230-260g were divided into control, sham, Wi-Fi exposed groups. After long term exposure (4 h/day for 45 days) to Wi-Fi EMR, plasma levels of glucose and insulin during intraperitoneal glucose tolerance test were measured. Islet insulin secretion and content, lipid peroxidation, and antioxidant status in pancreas of rats were determined.

**Results:** Our data showed that the weight gain in the Wi-Fi exposed group was significantly lower than the control group ( $p < .05$ ). Wi-Fi (2.45 GHz)-exposed group showed hyperglycemia level and glucose-stimulated insulin secretion from pancreatic islet were significantly lower in Wi-Fi exposed group. EMR emitted from Wi-Fi caused a significant increase in lipid peroxidation and significant decrease in GSH level, SOD, and GPx activities of the pancreas.

**Conclusions:** These data showed that EMR of Wi-Fi leads to hyperglycemia, increased oxidative stress, and impaired insulin secretion in the rat pancreatic islets.

Effects of olive leaf extract on metabolic disorders and oxidative stress induced by 2.45 GHz WIFI signals



Myriam Ben Salah<sup>1,2,\*</sup>, Hafedh Abdelmelek<sup>1</sup>, Manef Abderraba<sup>1</sup>

"RF Exposure induced a diabetes like status"

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ABSTRACT

We investigated the effect of olive leaf extract administration on glucose metabolism and oxidative response in liver and kidneys of rats exposed to radio frequency (RF). The exposure of rats to RF (2.45 GHz, 100 mW) during 21 consecutive days induced a diabetes-like status. Moreover, RF decreased the activities of glutathione peroxidase (GPx -31.13% and -49.62%), catalase (CAT -43.33% and -55.82%) and the superoxide dismutase (SOD -59.19% and -68.53%) and groups that amount -51.03% and -34.85%, respectively in liver and kidneys. Indeed, exposure to RF increased the malondialdehyde (MDA) (29.43% and 51.35%) concentration, respectively in liver and kidneys. Olive leaf extract administration (100 mg/kg) in RF exposed rats prevented glucose metabolism disruption and restored the activities of GPx, CAT and SOD and thus group amount in liver and kidneys. Moreover, olive leaf extract administration was able to keep from the elevated levels of MDA in liver but not in kidneys. Our present findings suggested that RF exposure induced a diabetes-like status through alteration of oxidative response. Olive leaf extract was able to correct glucose metabolism disorder by minimizing oxidative stress induced by RF in rat tissues.

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Wi-Fi leads to hyperglycemia, increased oxidative stress and impaired insulin secretion"

Salah, M. B., Abdelmelek, H., & Abderraba, M. (2013). Effects of olive leaf extract on metabolic disorders and oxidative stress induced by 2.45 GHz WIFI signals. *Environmental Toxicology and Pharmacology*, 36(3), 826-834.

Original Article

Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health

American Journal of Health Sciences  
 1-4  
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Conclusion: Significant impairment in motor

**Abstract**

The use of mobile phones has remarkably increased the use of mobile phones. The installation of mobile phones in residential areas including near school buildings, electromagnetic field (RF-EMF) radiation generate volunteer male students aged between 13 and 16 were from School 1 and 93 students were from 5 buildings. In School 1, RF-EMF was 2.010  $\mu\text{V}/\text{cm}^2$  with a frequency of 925 MHz. Students period of 2 years. The Nerts Safety Test Solution cognitive functions tasks were measured by the Cambridge Neuropsychological Test Automated Battery (CANTAB). Significant impairment in Motor Screening Task (MOT;  $p = .03$ ) and Spatial Working Memory (SWM) task ( $p = .04$ ) was identified among the group of students who were exposed to high RF-EMF produced by MPBSTs. High exposure to RF-EMF produced by MPBSTs was associated with delayed fine and gross motor skills, spatial working memory, and attention in school adolescents compared to students who were exposed to low RF-EMF.

# screening task and spatial working memory was identified among the group of students exposed to the high RF-EMF from mobile phone base station.

Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2019). Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health. *American Journal of Men's Health*.

Li, Y., & Héroux, P. (2014). Extra-low-frequency magnetic fields alter cancer cells through metabolic restriction. *Electromagnetic Biology and Medicine*, 33(4), 264-275.

- **OBJECTIVES:** Examine the effect of ELF-MFs on cancer cells.
- **METHODS:** Five cancer cell lines were exposed to ELF-MFs within the range of 0.025 to 5  $\mu\text{T}$ , and the cells were examined for karyotype changes after 6 days.
- **CONCLUSIONS:** The biological effects of MFs are connected to an alteration in the structure of water that impedes the flux of protons in ATPS channels. These results may be environmentally important, in view of the central roles played in human physiology by ATPS and AMPK, particularly in their links to diabetes, cancer and longevity.

# Oxidative Stress - Definitions

- Redox (reduction-oxidation) reactions are at core of human metabolism
  - Involve the transfer of electrons or hydrogen atoms from one reactant to another
  - Oxidation - taking away an electron (because oxygen does it so well)
  - Reduction - substance receiving electrons becomes reduced
- Free Radical - molecule containing a single unpaired electron
  - Reaction of a radical with non radical → chain reaction generating a new radical. Most molecules in body are stable (non radicals), therefore excessive ROS must be controlled by antioxidants.
  - ROS damage what they collide with seeking electrons (proteins, fats, DNA)

McCord, J. M. (2000). The evolution of free radicals and oxidative stress.  
*The American journal of medicine*, 108(8), 652-659.

• RF generates oxidative stress, which is implicated in CVD

• RF may contribute to CVD via oxidative cellular damage

an environmental pollutant with acute as effects.

Despite the European Academy for Environmental Medicine (EUROPAEM), and the American Academy of Environmental Medicine (AAEM) publishing evidence linking RF-EMR to adverse health effects and calling for exposure reduction, there is widespread ignorance about the scientific evidence of radiofrequency-induced biological health effects within the medical community. This appears to be largely due to the controversy triggered by the International EMF Project of the World Health Organization (WHO), which has opened the way for a large group of international electromagnetic field (EMF) scientists to propose exposure regulations.

The WHO's International Agency for Research on Cancer (IARC) appointed an expert panel to examine the evidence related to cancer in 2001, which concluded

acute radiofrequency exposure under experimental settings<sup>11</sup> in mobile phone users<sup>12</sup> and rodents near mobile phone base stations.<sup>13</sup> Restricted physical scientists have recently presented experimental evidence and a theoretical explanation on how low-intensity RF-EMR can generate OS.<sup>14</sup>

OS is known to be implicated in CVD<sup>15</sup> and therefore RF-EMR, a new ubiquitous environmental exposure, may contribute to CVD by maintaining chronic OS and thereby causing oxidative damage to cellular components and altering signal transduction pathways.

Acute RF-EMR exposure has been shown to increase blood pressure under experimental conditions<sup>16</sup> while chronic exposure has been found to be associated with an increased CVD risk<sup>17</sup> as well as alterations in the diurnal rhythms of blood pressure

**Bandara, P., & Weller, S. (2017). Cardiovascular disease: Time to identify emerging environmental risk factors. In: SAGE Publications Sage UK: London, England.**

Dr. P. Bandara, Swedish Academy of Medicine (SMA) member, Sweden, Author

Corresponding author:  
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Email: pbandara@bt.com



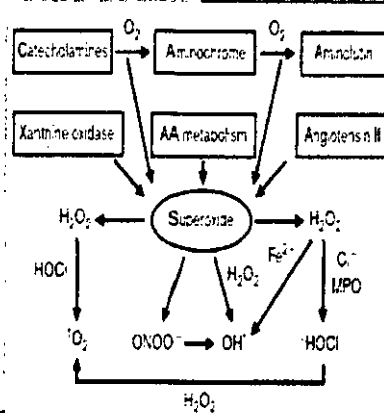
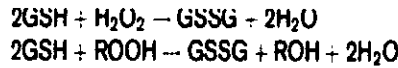
NO<sup>\*</sup> Nitric oxide  
 NO<sub>2</sub><sup>\*</sup> Nitrogen dioxide  
 ONOO<sup>-</sup> Peroxynitrite  
 CCl<sub>3</sub><sup>\*</sup> Trichloromethyl

**Non-radicals**

H<sub>2</sub>O<sub>2</sub> Hydrogen peroxide  
 HOCl Hypochlorous acid  
 ONOO<sup>-</sup> Peroxynitrite  
<sup>1</sup>O<sub>2</sub> Singlet oxygen

**Nonenzymatic scavengers**

Vitamin A  
 Vitamin C (ascorbic acid)  
 Vitamin E (α-tocopherol)  
 β-carotene  
 Cysteine  
 Coenzyme Q  
 Uric acid  
 Flavonoids  
 Sulfhydryl group  
 Thioether compounds



halli, N. S., Tamsah, R. M., & Netticadan, T. (2000). Role of oxidative stress in cardiovascular diseases. *Journal of Hypertension*, 18(6), 655-673.

The superscripted bold dot indicates an unpaired electron and the negative charge indicates a gained electron. GSH, reduced glutathione; GSSG, oxidized glutathione; R, lipid chain. Singlet oxygen is an unstable molecule due to the two electrons present in its outer orbit spinning in opposite directions.

REVIEW ARTICLE

MECHANISMS OF DISEASE

The Failing Heart — An Engine Out of Fuel

David S. Neubauer, M.D., M.Sc.

**H**ART FAILURE IS AN ENORMOUS GLOBAL AND ECONOMIC BURDEN. It is a common end-stage disease that affects a population of 20 million people worldwide, and 300,000 patients die each year. In the United States alone, the direct and indirect costs of heart failure are estimated to be \$30 billion annually. The prevalence of heart failure is increasing worldwide, and the number of patients with heart failure is expected to rise sharply in the coming decades.

From the Department of Cardiology, Harvard Medical School, and Brigham Young University, Salt Lake City, Utah.

Over the past 20 years, there has been considerable progress in our understanding of the mechanisms of heart failure. The most important advances have been in the areas of neurohormonal regulation, myocardial remodeling, and the role of oxidative stress. These advances have led to the development of new therapies that have improved the survival of patients with heart failure. However, there is still a need for more effective treatments, particularly for the prevention and treatment of heart failure.

The most important advance in the treatment of heart failure is the use of angiotensin-converting enzyme inhibitors. These drugs have been shown to improve survival in patients with heart failure, and they are now considered the standard of care for the treatment of heart failure.

THE INTEGRATED METABOLISM

The concept of integrated metabolism is a new paradigm in the study of heart failure. It is based on the idea that the heart is a highly integrated system, and that the various components of the heart are interconnected and interdependent. This concept has led to the development of new therapies that target multiple components of the heart, and that have shown promise in improving the survival of patients with heart failure.

CURRENT TRENDS

Improvements in the treatment of heart failure have led to a decrease in mortality. However, there is still a need for more effective treatments, particularly for the prevention and treatment of heart failure.

# The Failing Heart An Engine Out of Fuel

- Cardiac metabolism is heavily ATP dependent - Heart consumes more energy than any other organ – about 6 kg of ATP/day
- Activity of electron transport-chain complexes and ATP synthase capacity are reduced in heart failure. Therefore, insufficient ATP available for cardiac myocytes.
- Author suggests (pharmacologic) stimulation of oxidative phosphorylation as future metabolic therapy for CHF

Neubauer, S. (2007). The failing heart—an engine out of fuel. *New England Journal of Medicine*, 356(11), 1140-1151.

From: PA SafeTech pasafetech@gmail.com  
 Subject: Research  
 Date: January 10, 2020 at 8:12 AM  
 To: Liza Mousios cumming@epix.net



# Microwave Effects – Small Versus Large Doses

Small doses increase parasympathetic tone

Higher dose increases sympathetic tone

“Dosage cannot be simply determined even under completely identical physical conditions (wavelength, type of transmitter, etc.) - the same dosage under otherwise equal conditions can cause parasympathetic reactions in one patient and sympathetic reactions in another”

“The effect even differs in one and the same patients at different times”

Consequently, the dosage cannot be based on the principle of measuring the energy absorbed by the body, but must also be based on the principle of measuring the reaction of the body to the absorbed energy.

	Dose	
	Small	Large
Galvanic skin resistance	Increases	Decreases
Blood pressure	Decreases	Increases
Vessels (capillaries)	Dilated	Constricted
EEG	High-frequency oscillations	"Slow" waves
Muscle tone	Decreases	Increases
Diuresis	Promoted	Inhibited
Pain symptoms	Reduced	Enhanced

Table 1. – Indications of the reactions of the autonomic systems with short-wave irradiation.

Bergman, W. (1965). *The Effect of Micro Waves on the Central Nervous System: Ford Motor Company.*

## Role of oxidative stress in cardiovascular diseases

Naranjan S. Dhalla, Rana M. Temsah and Thomas Netticadan

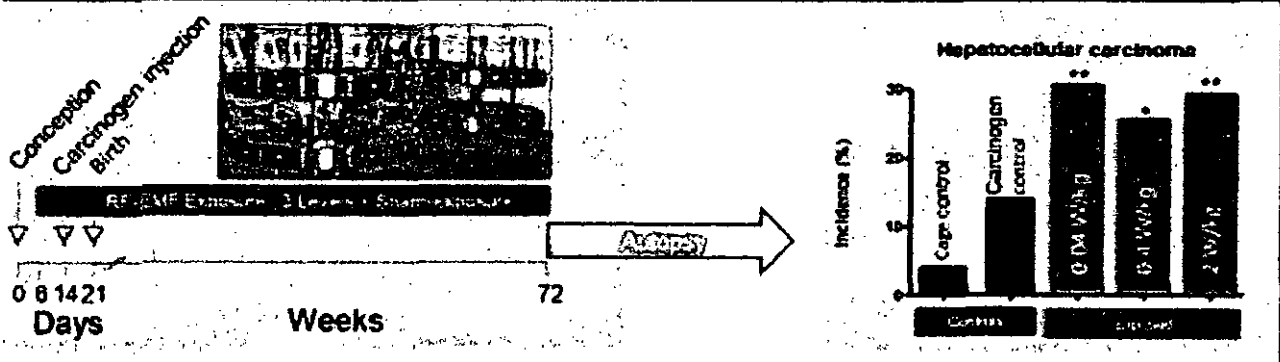
Table 1 The cytotoxic reactive oxygen species and the natural defense mechanisms

Reactive oxygen species		Antioxidant defence mechanisms	
<i>Free radicals</i>		<i>Enzymatic scavengers</i>	
O <sub>2</sub> <sup>•-</sup>	Superoxide anion radical	SOD	Superoxide dismutase
OH <sup>•</sup>	Hydroxyl radical		2O <sub>2</sub> <sup>•-</sup> + 2H <sup>+</sup> → H <sub>2</sub> O <sub>2</sub> + O <sub>2</sub>
ROO <sup>•</sup>	Lipid peroxide (peroxyl)	CAT	Catalase (peroxisomal-bound)
RO <sup>•</sup>	Alkoxy		2H <sub>2</sub> O <sub>2</sub> → O <sub>2</sub> + H <sub>2</sub> O
RS <sup>•</sup>	Thiyl	GTP	Glutathione peroxidase

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# RF Below Safety Limits Promotes Tumors Mice: 24/7 RF Exposure, In Utero Eno (A Replication Study)



Higher liver and lung tumors  
2.5 fold increases in Lymphoma  
Nonlinear effect "may be due to metabolic changes"

Lerchl 2015

*"Our findings may help to understand the repeatedly reported increased incidences of brain tumors in heavy users of mobile phones"*

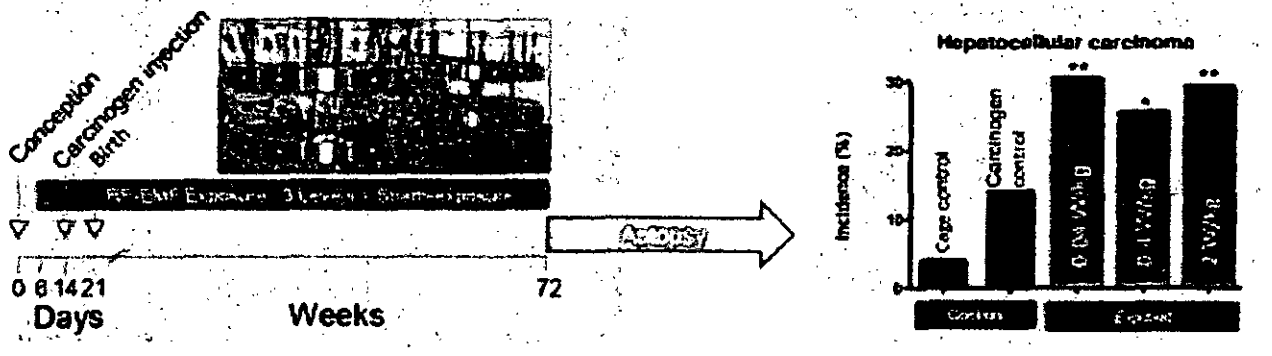
ENVIRONMENTAL  
HEALTH TRUST

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 Subject: Please save me a list of these if you are typing them out.  
 Date: January 10, 2020 at 8:14 AM  
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# RF Below Safety Limits Promotes Tumors

## Mice: 24/7 RF Exposure, In Utero Eno (A Replication Study)



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THE ENVIRONMENTAL HEALTH TRUST

From: PA SafeTech pasafetech@gmail.com  
 Subject: Maybe duplicates  
 Date: January 10, 2020 at 8:21 AM  
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# RFR Causes Oxidative Stress

**ELECTROMAGNETIC  
 BIOLOGY  
 AND MEDICINE**

Volume 35(2) 2016  
 ISSN 1522-0248

**informa  
 healthcare**

REVIEW ARTICLE

## Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation

I. Skymenko, O. Tsybulin, E. Sidorik, D. Henshel, D. Kyrylenko, O. Kyrylenko, S. Kyrylenko

Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine  
 Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine  
 Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine  
 Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine  
 Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine  
 Department of Radiology, National University of Health and Medicine, Kyiv, Ukraine

**Abstract**

The aim of the present study was to investigate the oxidative mechanisms of biological activity of low-intensity radiofrequency radiation (RFR) in living cells. The study was conducted using a model of oxidative stress in cells. The results of the study show that RFR induces oxidative stress in cells, leading to the formation of reactive oxygen species (ROS) and reactive nitrogen species (RNS). The study also shows that RFR induces the production of nitric oxide (NO) and superoxide anion (O<sub>2</sub><sup>-</sup>), which are known to be involved in the regulation of cellular signaling pathways. The study concludes that RFR is an oxidative agent for living cells with a high pathogenic potential.

**Keywords**

Low-intensity radiofrequency radiation, oxidative stress, reactive oxygen species, reactive nitrogen species

**History**

Received 10 January 2016  
 Accepted 10 February 2016  
 Published online 10 March 2016

- Review of 100 available peer reviewed studies of oxidative effects of low intensity RFR
- 93/100 confirmed that RFR induces oxidative effects in biological systems
- Conclusion: Low intensity RFR is an oxidative agent for living cells with a high pathogenic potential

Skymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016). Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation. *Electromagnetic Biology and Medicine*, 35(2), 186-202.

## Stroke in the Young – An Epidemic

- George et al. (2017) reviewed U.S. hospitalization data from the National Inpatient Sample
- Review of two large data sets (combined n=784,154 hospitalizations) showed significant increase in acute ischemic stroke (AIS) hospitalization rates for men and women
- Rates have nearly doubled for men aged 18-34 and 35-44 since 1995-1996. Rates for older adults 55-64 have not changed from 2003-2004
- Trends are consistent with other studies.

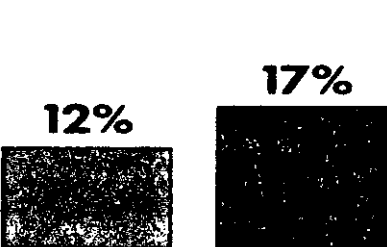
George, M. G., Tong, X., & Bowman, B. A. (2017). Prevalence of cardiovascular risk factors and strokes in younger adults. *JAMA neurology*, 74(6), 695-703.

### CANCER RATES RISE IN GEN X AND MILLENNIALS

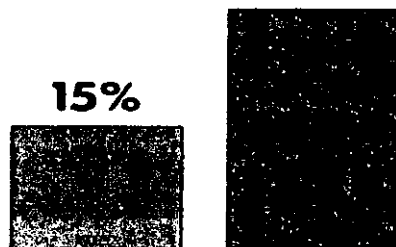
People under age 55 make up an increasing share of colon and rectal cancer cases in the United States:

● 1990 ● 2013

Share of colon cancers



Share of rectal cancers



# Millimeter Waves Power Active Crowd Control Weapon

--Uniquely Interact With Skin

Sweat glands act as helical antennas that absorb millimeter frequencies

(Betzael 2018)

*"A moratorium on the deployment of 5G is warranted..."*

-Scientists Appeal to UN, 2015

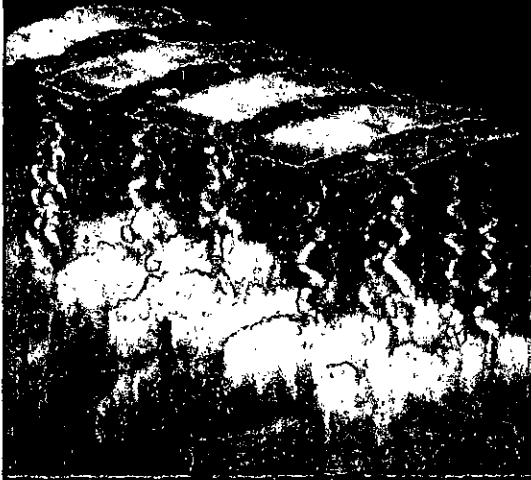


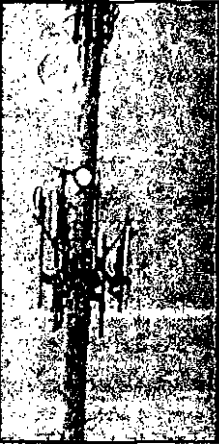
Image: Lecture by Dr. Ben-Ishai and Dr. Yuri Feldman of the Spectroscopy Laboratory of the Department of Applied Physics, Hebrew University of Jerusalem

## IMPACT OF RFR ON DNA DAMAGE & ANTIOXIDANTS IN PERIPHERAL BLOOD LYMPHOCYTES OF HUMANS RESIDING IN THE VICINITY OF MOBILE PHONE BASE STATIONS.

(ZOTHANSIAMA ET AL. 2017)

- Study evaluated the effect of radiofrequency radiation from mobile phone base stations.
- Compared residents- matched for demographics.
- Exposed group: Within 80 meters



- 
- Control group: Over 300 meters
- RF measurements ensured all RF levels were below India's limits (1/10 of ICNIRP)

*Significant biological effects found on individuals closer to mobile base stations (within 80 meters).*

- Alteration in antioxidant status in the plasma of exposed individuals
- Decreased glutathione concentration, activities of catalase, superoxide dismutase



01/12/2020

Liza Mousios  
P O. Box 116  
Revere, PA 18953-

To Whom It May Concern:

Since 1996, Ms. Mousios has resided the majority of the time at her home residence without incident. However, on or about March 27, 2019, she has been living in her car or tent since, beginning of the day after the a smart meter was installed at her adjacent next door neighbor's house. She continues to be itinerant, living in various locations including her car, a tent and intermittently at friends houses who do not have a smart meter or smart meter close to their house.

Prior to the instillation of the adjacent neighbors smart meter, she had been treated at our office for chronic kidney infections, multiple chemical intolerance syndrome and neuralgia pain from a motor vehicle accident.

However, she developed sudden and new symptoms upon the smart meter installation at the end of March, 2019. She was first evaluated at our office on 4/2/2019 with exposure related symptoms included stabbing chest pains, shortness of breath with tightness in the chest, headache, head and ear pressure with high-pitched ringing, joint and muscle pain. In addition she had new onset of vomiting blood and accompanying weight loss. At that office visit of 4/2/2019, she had physical examination findings revealing new thyroid fullness and swelling. Of note, and unrelated to her medical conditions, she also reports that her pet dogs began vomiting and losing weight.

Despite having to experience significant cold temperatures and wind conditions, her symptoms improved from living in her car or tent away from the smart meter. She also reported that when she was able to periodically stay with friends that did not have a smart meter nor any neighbor adjacent smart meter, her symptoms resolved. Anytime she would return to her residence, with the adjacent neighbor smart meter, her above-stated symptoms would return.

On 5/31/2019, at a follow up office visit, after the patient left her residence to avoid smart meter exposure, she had a repeat thyroid exam that was entirely normal.

In my medical opinion, to a reasonable degree of medical certainty, Ms. Mousios has electromagnetic hypersensitivity. Her smart meter exposure symptoms consistently recur upon exposure and dramatically improve with avoidance measures. The current smart meter at her adjacent neighbors home prevents her from residing in her residence in which she has a piano, and a companion, heat, shower and a bed. She is a professional musician and her piano is required in order for her to perform her music profession. Consequently, I medically recommend that her neighbors smart meter be removed or relocated at a significant distance from Ms. Mousios' residence.

Sincerely,

Provider:

Kracht DO, William 01/12/2020 3:58 PM

Document generated by: William Kracht 01/12/2020

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Integrative Family Medicine  
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**William S. Bathgate**  
Certifications - PMP, ITIL, COBIT, CISA, CRISC, CISM, CGEIT  
US DOD Top Secret Security Clearance  
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## **Global Technology Professional**

### **Professional Work History**

#### **2015 - 2018 TATA Consulting, Fiat Chrysler Automotive Account – Current Position**

##### **2015 – 2018 Global Program Manager – Auburn Hills, MI**

Manger of Global Programs for enhancements of systems for MOPAR, Secure Vehicle. U-Connect Radio Systems, Connected Vehicle and Autonomous Vehicles. Reports directly to FCA Director of Systems Planning.

#### **2009 - 2015 Emerson Electric Corporation, Avocent Division**

##### **2009 – 2015 Global Engineering Program Manager, Emerson Corporation, Avocent Div. – Huntsville, AL**

Program Manager of a power distribution products portfolio. Responsible for global engineering development and release of newly developed electrical products engineered in the USA and Germany but built in in Mexico and Czech Republic. This product is called MPH and MPH II. This is a computer network controlled high voltage and high amperage load control device engineered for worldwide installations adapted for each local countries either three phase and single phase AC distribution grid. As Program Manager I also provided direction and oversite of product safety testing and certifications, such as UL, CSA, CE, and PSE for product safety compliance in over 100 countries. So far over 1 Million units of the products I developed are in service. This role reported to the Vice President of Engineering of Emerson's Avocent Division.

#### **1995–2009 Hewlett-Packard Co.**

##### **1995-2009 Managing Director, Computer Systems Engineering**

Now this division is called "Keysight Technologies". Developed new automated instrument calibration systems and new circuit designs for oscilloscopes, high precision DC power supplies, EMI & EMC Measurements, Phase Noise, Physical Layer Test Systems, RF & Microwave Test Accessories, Device Current Waveform Analyzers, AC and DC power analyzers. Network analyzers and vector signal analyzers.

#### **1983–1995 IBM Corporation**

##### **1983-1995 IBM Corporation, Electronic Systems Engineer, Systems Division – Armonk, New York**

Developed Mainframe computer CPU, Memory and Input and Output peripherals for S/370 and S/3090 platforms. Part of the design team for the first IBM PC products, responsible for power supplies, main computer circuit boards and Operating Systems integration. Also assigned to NASA in Houston, Cape Canaveral and Marshall space flight centers for launch control and space vehicle telecommunications using high frequency and microwave RF signals.

#### **1977–1983 Textron Corporation**

##### **1977-1983 Textron Corporation, Sundstrand Division, Control Systems Engineer – Rockford, IL**

Developed Electronic Control Systems for control of Aerospace applications generating power for inflight services, control of engine start, elevators, rudder and aileron controls. Subcontractor to Lockheed Martin for enhancements to the flight data recorder (Black Box) improving circuit mountings for improved crash survival.

Developed control systems for off road construction equipment such as cement mixers, combines, bulldozers and high rise cranes.

### **Industry Certifications & Expertise**

Certified Project Management Professional (PMI/PMP)  
Certified in Governance of Enterprise IT (CGEIT)  
Certified in Risk and Information Systems Control (CRISC)  
Certified Information Systems Auditor (CISA)  
Certified Information Security Manager (CISM)  
Certified in Control Objectives of IT (COBIT)  
Certified in Information Systems IT Infrastructure Library (ITIL) for Operations, Design and Configuration

FCC Amateur Extra Class License Holder  
FCC Land Mobile License Holder  
FCC Marine Mobile License Holder

High tech power management systems, UPS and power distribution  
Switched Mode Power Supplies  
Electrical and Electronic hardware engineering  
Computer systems engineering  
Radio Systems design and testing  
High Current and High Voltage switches  
Internet communications using both wired and wireless technologies  
UL, CE (Europe), Africa, Japan, Australia and China product safety certifications  
Cyber encryption and protection of Radio Communications using digital signals  
RFI/EMI mitigation

Hold a US-DOD Top Secret Clearance and am an instructor of information security encryption control and compliance to the US Missile Defense Agency, NASA, and US Department of Homeland Security.

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