

## **Comment for the Access Board about Disabling EMR Exposure**

By Katie Singer, author of *An Electronic Silent Spring*, (Rudolph Steiner Books, 2014), [www.electronicsilentspring.com](http://www.electronicsilentspring.com); consultant for educational programs with the EMR Policy Institute, [www.emrpolicy.org](http://www.emrpolicy.org).

Regulation of electronic technologies has not kept up with deployments. As a result, several segments of the population are disabled by exposure to electromagnetic radiation (EMR) emitted by common electronics and infrastructure. **This email outlines:**

1. How EMR and/or screen-time exposures currently affect four segments of the US population.
2. Policies that would make areas of public accommodation more accessible to these populations.

### **One**

#### **How EMR exposure affects people with medical implants, children, workers and people with Microwave Sickness, aka Electropersensitive (EHS).**

##### *a. People with medical implants*

According to NIH, in 2000, 8-10% of the US population had a medical implant--i.e. a cardiac pacemaker, insulin pump, cochlear implant, deep brain stimulator (DBS) (for Parkinson's, PTSD or other neurological disorder), etc.

Exposure to EMR emitted by common electronics can cause "electromagnetic interference" (EMI) with a medical implant, resulting in the implant's being reprogrammed or shut off.<sup>1,2,3,4,5</sup>

Neither patients nor physicians are well informed about the situation.

An implant can malfunction and/or shut off if its patient:

boards an airplane, subway, electric bus or train (an insulin pump can also interfere with a plane's avionics);<sup>6</sup>

shares an elevator with mobile phone users;<sup>7</sup>

steps through security doors at a mall, govt. bldg or stadium;<sup>8</sup>

lives or works near wireless transmitting "smart" utility meters;<sup>9</sup>

approaches large electric motors (i.e. refrigerators and air conditioners [possibly hidden behind a wall]);<sup>10</sup>

approaches TV or radio broadcasting antennas, cellular or Internet antennas, WiFi routers (possibly hidden);<sup>11</sup>

has electro-cautery tools or defibrillators used on them;<sup>12</sup>

approaches wireless chargers such as those recently deployed in Starbucks and planned for IKEA furniture;<sup>13</sup>

has more than one kind of implant (implants can interfere with each other).<sup>14</sup>

rides in an electric or hybrid car or a car with sensors for steering, breaking or navigating (sensors emit EMR internally *and* to the car's exterior). Self driving cars and trucks may also come with EMR-emitting wireless chargers,

Recent manuals from Medtronic (the U.S.'s largest manufacturer of medical implants) states that DBS patients must keep cell phones at least 20" from their head and body. At closer range, the cell phone will cause dangerous heating of the implant. If the implant gets too hot, it will malfunction, the patient's brain could be injured, or the patient could die.

Wireless monitors commonly used in hospitals may negatively impact patients' health. Wireless monitors (including heart and fetal monitors) need to be tested for long and short term health impacts.

#### b. *Children*

##### ***Physicians are concerned about children's EMR exposure:***

Children's skulls are thinner than adult skulls and therefore more vulnerable to EMR exposure. Unlike the FCC, the Air Force recognizes that EMR exposure affects five and ten year old boys and adult men differently.<sup>15</sup>

In IEEE's *Spectrum* Dr. Om Gandhi, prof. of electrical engineering at the Univ. of Utah, co-chair of IEEE's Subcommittee on RF Safety Standards (1988-97) and Chair of IEEE's Committee on Man and Radiation (COMAR) 1981-82, wrote: "it is very hard to understand why" FCC's safety guidelines only consider the head of a mannequin whose size is in the 90th percentage of US military recruits--and do not consider children's head size.<sup>16</sup>

Children exposed to EMR emitted by WiFi, iPads and other mobile devices can present with bloody noses, bleeding from the ears, headaches, rashes, sleep disturbances, migraines, heart palpitations, dizziness, nausea, behavioral problems and many other symptoms.<sup>17</sup>

Dr. Hugh Taylor, MD, head of Yale Medical School's ob/gyn dept., warns pregnant women and children to decrease exposure to cell phones and Wi-Fi as much as possible.<sup>18</sup>

Dr. Martha Herbert, MD, PhD, pediatric neurologist at Harvard Medical School and Cindy Sage, MA, coeditor of *The BioInitiative Reports* explored the plausible links between EMR exposure and autism.<sup>19</sup> In a Feb., 2013 letter to the Los Angeles Unified School District, Dr. Herbert wrote: "EMF/RFR from WiFi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function." She urged the LAUSD to "opt for wired technologies."

Children with autism and ADHD have shown significant improvements in their behavior, sleep and digestion when parents turn off Wi-Fi for 12 hours at night and keep children eight feet from cordless phones and mobile devices.<sup>20</sup>

##### ***Physicians are concerned about children's screen-time exposure:***

The American Academy of Pediatrics (AAP) and Kaiser Permanente warn that too much screen time is associated with children's violent behavior, poor school performance, lower reading scores, sleep disturbances, obesity and bad habits later in life such as tobacco and alcohol abuse.<sup>21,22</sup>

In October, 2013, the AAP issued a policy statement, "Managing Media: We Need a Plan." The AAP recommends that entertainment screen time be limited to less

than one or two hours per day. For children under two, the AAP discourages screen media exposure.

Kaiser recommends limiting screen time to less than two hours per day for teens, less than one hour per day for children three through twelve, and no screen time for children under three.

Child psychiatrist Dr. Victoria Dunckley, MD reports studies that show that interacting with screens (i.e. via keyboards or video games) is more hazardous to brain development than passive TV screens. Dr. Dunckley has developed a three week "electronic fast" that has resulted in hundreds of children ending meltdowns, improving grades and boosting social skills by reversing the effects of electronic screen-time.<sup>23</sup>

### c. *Workers*

A.M. Best Co. estimates that 250,000 workers come into close contact with cellular antennas every year. It warns insurers that at close range, cellular antennas act "essentially as open microwave ovens;" and that exposed workers' health effects "can include eye damage, sterility and cognitive impairments." Underwriters, including A.M. Best and Lloyds of London, advise insurance companies not to ensure against damages to health caused by wireless devices, including cellular antennas. Swiss RE rates man-made electromagnetic fields higher than any other emerging health risk.<sup>24</sup>

In his 9.11.13 Comment to the FCC about radio-frequency exposure limits, Edwin D. Hill, Int'l President of the Int'l Brotherhood of Electrical Workers (IBEW), stated, "we believe that many of our members have been exposed to levels of RF radiation in excess of the FCC limits.... When there is a hazard, the hazard creator has a duty to warn others against the hazard." He suggested that telecom companies that are licensed to deploy transmitting antennas should be responsible for ensuring that IBEW members "know the unique physical boundaries at every work location so as not to exceed the referenced RF exposure limits." At present, telecom corporations are not required to post signs that inform workers that an antenna (which may be disguised or in a chimney) is nearby.

In Sept. 2015, Sen. Richard Blumenthal (D-Conn) and Rep. Anna Eshoo (D-Calif.) wrote FCC Chair Tom Wheeler "even though the FCC recommends that wireless carriers control exposure to harmful RF radiation using safety protocols such as signs, barricades and training...these recommendations have not consistently been implemented to protect workers." Because cellular antennas are now found atop apartments, schools, hospitals, churches and fire stations, "RF technicians but also roofers, water proofers, electricians, carpenters, building maintenance personnel, HVAC technicians, painters, firefighters" and others are at risk of EMR exposure. While the FCC has made deploying wireless broadband a priority, including easing tower siting policies, these senators don't want that to come at the expense of safety.<sup>25</sup>

### d. *People with Microwave Sickness, aka Electro-hypersensitivity (EHS)*

Caused by exposure to EMR-emitting devices (individually, in combination or over time), EHS may result in disabling nausea, migraines, tremors, tinnitus, poor memory, poor concentration, insomnia, tinnitus, dementia, rashes and other symptoms. People with

EHS may be unable to work in or visit areas of public accommodation, including schools, libraries, government buildings, hospitals and doctors' offices. They may be unable to travel on planes, subways, trains, busses, shuttles. They may have difficulty finding housing without "smart" meters or WiFi.

EHS was reported by Americans exposed to EMR in the U.S. Embassy in Moscow.<sup>26,27</sup> A study by the Calif. Dept. of Health found that 3% of Californians believe they have EHS. Five percent of Swiss people<sup>28</sup> and 13.3% of Taiwan's 2010 population<sup>29</sup> experience EHS.

## Two

### **Policies that would make areas of public accommodation more accessible for people with implants, children, workers and people with EHS:**

#### *1. Require posted warnings i.e.*

WARNING  
approaching an area with high levels  
of electromagnetic radiation  
that could cause a medical implant  
to malfunction or shut off

Require such postings on planes, electric trains, near radio and TV broadcasting antennas, near cellular and Internet service antennas, WiFi routers, near metal detectors, near equipment with large motors such as large refrigerators and MRIs, etc.

To protect workers with implants, require warning signs near electrical utility rooms, WiFi routers and cellular antennas in hotels, libraries, schools, government buildings, restaurants, apartment buildings, malls, medical centers.

In elevators (metal boxes that trap EMR), signs could warn that using cell phones in an elevator can cause medical implants to malfunction or shut off.

Magnetic fields in electric and hybrid cars and other late-model cars may be especially high. Sitting in some seats may cause an implant to malfunction. Some seats may expose children to unsafe levels of EMR.<sup>30</sup> Hybrid, electric and other cars could post a warning (similar to those in newer cars about air bags and children:

WARNING  
because of high levels  
of electromagnetic radiation,  
children and people with deep brain stimulators  
should not sit in \_\_\_\_ seats

All medical treatment centers, including emergency rooms and doctors' offices should prohibit cell phone use and WiFi. Signs should require visitors to turn off devices to prevent electronic interference with medical implants.

Wireless devices, including mobile phones, watches, rings, iPads should be labeled:

WARNING  
electromagnetic fields  
emitted by this device  
could cause a medical implant  
to malfunction or shut off

At malls, inventory control devices need warnings that their high electromagnetic fields may cause a medical implant to malfunction or shut off. As an alternative, at a store's exit, a person should check receipts.

## 2. *Create videos to train*

\* medical personnel, including first responders, school nurses, ob/gyns, pediatricians, family practice MDs, surgeons, chiropractors, acupuncturists, professionals in public health and disability rights etc. about:

electronic interference between common electronics and implants;

precautionary practices for pregnant women

identifying and treating EHS (perhaps modeled after Austrian Medical Association Guidelines)<sup>31</sup>

\* teachers, school administrators, school nurses and parents

about children's increased vulnerability to wireless technologies

to identify children needing reduced screen-time;

to identify EHS in students and employees;

to learn how to create healthy media diets.

\* employers--in order to make workplaces accessible to people with implants or EHS.

See case of Rebecca Serdars, RN, whose deep brain stimulator repeatedly malfunctioned while she worked in one dept. at a NY hospital. She requested a transfer to another dept. The hospital refused. She sued, won \$4 million in Nov, 2014; the hospital has appealed.

## 3. Schools, libraries, medical centers, govt. buildings and other *areas of public accommodation should*

\* *prefer wired connections*--for phones, Internet use, fetal and heart monitors, etc. Note that in 2008, public libraries in Paris, France, removed WiFi from their buildings because of librarians' health concerns.<sup>32</sup>

\* *keep WiFi off when not in use*, as practiced in Ashland, Massachusetts classrooms.

Note that in 2010, the government of Frankfurt, Germany stated that it will not install WiFi in its schools until it is proven harmless.<sup>33</sup>

\* *designate as wired-only areas*, as practiced in a Toronto hospital.

\* *disclose the location of all routers and transmitters*.

4. *Landlines must be maintained*. Some cardiac pacemakers require a landline with an acoustic modem to relay data to a physician, who then may need to send info about reprogramming the pacemaker, again via a hardwired landline. Medical offices require a landline with a fax to keep medical information confidential. Since Medtronic advises patients to keep deep brain stimulators at least 20" from cell phones, such patients also need landlines maintained.

5. *Blanket WiFi must be prevented* in municipalities (i.e. via Distributed Antenna Systems or Broadband Over Powerlines [BPL]) and/or the entire world (i.e. via satellites), since WiFi can cause implants to malfunction or shut off. People with implants, children and people with EHS require areas that do not have WiFi.

6. All households and workplaces with children, people with implants or people with EHS must be allowed to refuse wireless transmitting meters for gas, electric and/or water utilities--and to choose wired, analog meters at no charge. This requires a federal policy.

7. Microwave ovens are tested for EMR emissions before they leave the factory. Electrical grounds on buildings are tested at installation. However, aging of electronics and grounds often creates EMR emissions beyond compliance with standards and codes. Aging can also decrease energy efficiency. Wherever children, pregnant women, workers, people with implants or EHS spend time (homes, schools, libraries, hospitals, etc.), periodic retesting of EMR emissions from electronics, building electrical grounds and wiring should be required. Retesting should be conducted by independent testers supervised by ADA or FDA.

8. Printers, computers and other electronics should be required to have wired functions. All electronics should be required to have wireless capabilities shut off. New goods should be properly labeled for having a wired function.

## ENDNOTES

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