

**What is electrical sensitivity (ES)?**

Erica Mallery-Blythe, MD, describes ES as “an awareness and/or adverse symptomatology in response to ...electromagnetic fields.” [1]

**What are electromagnetic fields (EMFs)?**

EMFs are fields of force created when charged particles, such as electrons, are accelerated. Naturally-occurring EMFs make life on earth possible. People and animals have energy fields. Manmade EMFs at higher energy levels have increased rapidly.

Like other substances, EMFs are potential stressors. The effects can be beneficial (as when EMFs can stimulate bone healing), benign (not perceived), or harmful. EMF stressors can be 24/7 (e.g., from pulsed smart meter transmissions), intermittent (e.g., from cell phone use), or rare.

**What are the symptoms of ES?**

People report neurological (brain), cardiological (heart), endocrine (hormone) and/or gastrointestinal (gut) symptoms. “Health effects associated with exposure to radiofrequency electromagnetic fields include: Brain tumours, Headaches, Nausea, Depression, Sleep difficulties, Concentration problems, Memory loss, Tinnitus.”[2] Negative EMF health effects can range from minimal to profound.

**How do ES persons recover?**

ES symptoms can go away in consistently low-EMF home environments plus other measures.[3]. Electrically sensitive people:

- **Measure** to locate EMF sources and monitor exposures.
- **Eliminate or avoid** EMF triggers. Eg: replace smart meters with analog meters; replace clock radios with battery-operated clocks; replace cfl with incandescent bulbs; turn wifi and Blue Tooth to off.
- **Protect** from nearby EMFs that can't be eliminated or avoided. Eg: shield one's property or body, and filter or block EMF sources.
- **Strengthen** to become more resilient. Examples: practice prayer, meditation, stress reduction, yoga, etc.; work with medical practitioners trained in energy-related healing; healthy habits.

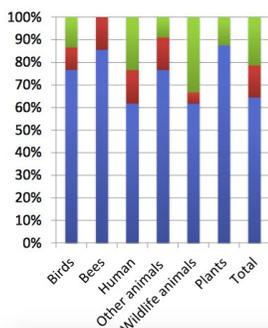
**Caution: People with ES who reverse their ES symptoms in a low-EMF environment still have ES. Continued attention to maintaining a low-EMF environment is advised.**

**What does science say about ES?**

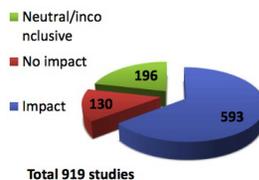
EMF health concerns relate to **radio frequency radiation, dirty electricity, and magnetic fields** (see page 2).

**Many studies indicate risk from over exposure**

**“EMF hypersensitivity can occur as a bona fide environmentally-inducible neurological syndrome,”** McCarty et al. (2011).



Number of studies on EMF impacts collected & collated based on study subjects & results (Rahmani et al. 2011).\*



\* Similar results were observed in Cucurachi et al. (2013)'s review of 113 studies. © Dr Isaac Jamieson 2014

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EMF health concerns are not new – e.g., Robert O. Becker, MD's 1985 book, The Body Electric.

While a current **Wikipedia** article says there is “no scientific basis” for ES, the article cites only a few older studies, and its neutrality is disputed (3/16) [4]. By 2005, the **World Health Organization (WHO)** had concluded that ES “symptoms are certainly real” and “can be...disabling”[5].

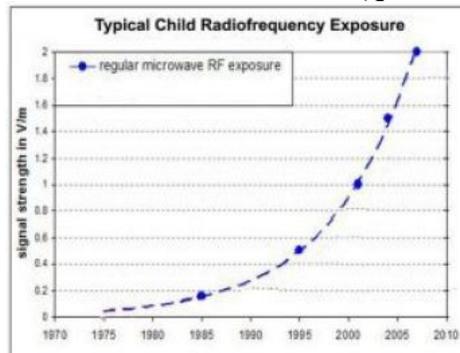
**WHO** in 2011 classified “radiofrequency electromagnetic fields as possibly carcinogenic to humans (Group 2B), based on an increased risk for glioma, a malignant type of brain cancer...”[6]

**Bioinitiative 2012 Report** concludes from more than 1800 studies that EMF “bioeffects are clearly established.”[7] These bioeffects include DNA damage, carcinogenicity, infertility, increased vulnerability in children, and fetal/neonatal risks, among others. 27 medical doctors, PhDs and scientists contributed to the nonprofit's report. The adverse bioeffects occur below guideline-recognized levels.

In 2013 the **American Academy of Environmental Medicine** asked the Federal Communications Commission (FCC) to “recognize non-thermal effects of RF exposure...and lower limits of RF exposure to protect the public from the adverse health effects of radiofrequency emissions.”[8]

In 2015, 220 scientists in an **International Electromagnetic Field Scientist Appeal** asked the United Nations to “address the emerging public health crisis related to cell phones, wireless devices, wireless utility meters and wireless infrastructure in neighborhoods.” [9]

**RFR exposures in children have increased a billion billion (quintillian) times in one generation.**



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**Magnetic fields** occur whenever electricity flows. Sources included power lines, electrical wiring and cords, computers, TVs, monitors and motors in both small and large electric appliances.

**Dirty Electricity** (also called HFVT) results when electronic devices convert electric alternating (AC) power to direct (DC) power. It interrupts electrical current flow along electrical wiring, outlets and electronic devices. HFVT reported health effects include increased cancer risks.[10] Electronic devices creating dirty electricity include computers, printers, phone chargers, low voltage lighting, dimmer switches, compact fluorescent light (cfl) bulbs, digital meters, and smart meters.

**Radio frequency radiation (RFR)** fields radiate outward in a pulsating pattern. The technologies that use RFR include wifi, cell phones, remote (cordless, DECT) phones, satellite TVs, microwave appliances and transmitters (cell towers and antennas), Blue Tooth, radar, smart meters and “smart appliances.”

**RFR** is “non-ionizing” (meaning energy excites electrons but doesn't remove them from a molecule or atom). The FCC limits only “ionizing” (heat-producing, cell-damaging) radiation. However, sufficient exposure to non-ionizing radiation (a matter of frequency, duration and intensity) may trigger an immune or other response (see bioeffects, above). Non-ionizing radiation-producing devices are not required to be shielded. Ionizing radiation damage is cumulative. Is non-ionizing radiation damage also cumulative?

## EMF Overview:

EMF Type	Began	Cycles/second (Hertz, or Hz)	Nature of Cycles	Measurement	Other Information
Schumann resonance, fundamental (Direct current)	(Earth created 4.5 billion years ago)	7.83 Hz	Global  Regarded as beneficial.	Global	Earth's molten magnetic core creates the magnetic field that surrounds earth and protects it from cosmic radiation.
Schumann resonances, 8 intervals (Direct current)	See row above	14.3, 20.8, 27.3, 33.8... up to 60 Hz	Local or global	Local or global	Lightning strikes influence the Schumann resonances.  Do human inventions also contribute?
Electricity (Alternating Current, with Magnetic & Electric Fields)	1879 (Edison's light bulb)	60 Hz	regular sine wave.	<b>Magnetic Fields</b> are measured in Gauss units	Concerns: effects of high voltage overhead lines (HVOLs), other cumulative magnetic field exposures (eg in homes and offices).
<b>Dirty Electricity</b> , result of AC-to-DC conversion	...	60 Hz contaminated with ----->	chaotic High Frequency Voltage Transients ( <b>HFVT</b> )	Measured in GS units [HFVT rate of change]	Book, <u>Dirty Electricity</u> by Samuel Milham, MD, MPH, available at Amazon or <a href="http://www.sammilham.com/">http://www.sammilham.com/</a>
<b>Radio frequency radiation</b> (RFR) fields	Recent	3,000 Hz to 300,000,000,000 Hz (USA)***	Pulsed (digital). Radiate outward.	Power density measured in milli-Watts per meter squared.	Video, <u>Take Back Your Power</u> (re: smart meters; transmit ~13,000 times/day), <a href="http://www.takebackyourpower.net">www.takebackyourpower.net</a>

\*\*\* 1kHz = 1 thousand Hz. 1MHz = 1 Million Hz. 1GHz = 1 Billion Hz.

### Sources:

- [1] <http://www.electricsense.com/4043/electrical-sensitivity-research-diagnosis-and-treatment/> (includes 1 hour video lecture)
- [2] Quoted from [www.powerwatch.co.uk](http://www.powerwatch.co.uk). See also list at <https://www.emfanalysis.com/ehs-symptoms/>
- [3] <http://www.electricsense.com>
- [4] [https://en.wikipedia.org/wiki/Electromagnetic\\_hypersensitivity](https://en.wikipedia.org/wiki/Electromagnetic_hypersensitivity)
- [5] <http://www.who.int/peh-emf/publications/facts/fs296/en/>
- [6] [http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208\\_E.pdf](http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf)
- [7] "Rationale for Biologically-Based Exposure Standards for Low Intensity Electromagnetic Radiation," <http://www.bioinitiative.org>
- [8] "To the FCC regarding the need to limit RFR transmissions," <https://www.aemonline.org/pdf/FCCLtr.pdf>
- [9] <http://www.emfscientist.org>
- [10] <http://www.stetzerelectric.com/category/research/>

### Other resource:

<http://www.phiremedical.org> (Physicians Health Initiative on Radiation and the Environment)

This handout is for information only and is not medical advice. For medical advice, please contact your doctor. Future developments may supercede information included on this handout.