

Understanding Electric and Magnetic Fields (EMF)

Electric and magnetic fields (EMF) are invisible lines of force that surround any electrical device. A "field" is the area in which charges interact with other charges. Electromagnetic fields consist of electric (E) and magnetic (H) waves traveling together. They travel at the speed of light and are characterized by a frequency and a wavelength. All EMFs are measurable: the frequency is simply the number of oscillations in the wave per unit of time, measured in units of hertz (1 Hz = 1 cycle per second), and the wavelength is the distance traveled by the wave in one oscillation (or cycle).



Electric fields are measured in *Volts per meter (V/M)* and are always present on charged electrical wires and devices plugged into outlets and are created by differences in voltage. The higher the voltage, the stronger will be the resultant field. AC electric fields are present any time an electric device or power cord is plugged in to an electric outlet. An electric field will exist even when there is no current flowing.

Electric fields exposure points: Energy-efficient CFL bulbs, computers and peripherals, metal lamps and clock radios.

Magnetic fields are measured in *milligauss (or microtesla)* and are created when electric current flows. If current does flow, the strength of the magnetic field will vary depending upon the amount of current (*amps*) drawn through the conductor but the electric field strength will be constant.



Magnetic fields exposure points: Power lines and electrical wiring and cords, faulty/knob & tube wiring, computers, CRT (cathode ray tube) TVs and monitors.

Dirty Electricity is measured in *Graham-Stetzer units (GS)*. But today, for a number of reasons, its becoming increasingly contaminated with invisible microsurgers of dangerous high frequency energy called "Dirty Electricity". Dirty Electricity has become a steadily growing problem in recent years due to our increased use of energy efficient CFL bulbs, dimmer switches, modern low-voltage lighting and electronic devices such as gaming systems and computers.

Dirty Electricity exposure points: All power lines, cords, electrical appliances and electronic devices plugged into circuits reading greater than 25-50GS units.



Radio Frequency fields are measured in microwatts per square centimetre ($\mu\text{Watt}/\text{cm}^2$). If the current flowing through the wire is made to oscillate at a very rapid rate (3 KHz or greater), the floating electromagnetic field will break free and be launched into space. At the speed of light, the energy will radiate outward in a pulsating pattern, much like the waves in the pond. Mankind has harnessed much of the radio spectrum for communication purposes such as Wi-Fi, cell phone, radio, satellite TV and radar.

Radio Frequency exposure points: PDAs, cell phones, microwave transmitters, DECT portable phones and Wi-Fi.

Electrical Hypersensitivity

Today, more and more people are experiencing adverse health effects as a result of ongoing exposure to Electric and Magnetic Fields (EMF).

According to a World Health Organization statement in December 2005: "Electrical Hypersensitivity (EHS) is a growing world wide health concern". EHS can be difficult to understand and even more difficult to diagnose. Many doctors and other health professionals in North America are not yet aware of the recent scientific evidence surrounding electromagnetic energy and its detrimental effects on human health.

Studies have shown that electrical pollution affects children more than adults and women are at least twice as susceptible as men. The huge increase in electromagnetic energy in today's modern electronic-charged environment coincides with an alarming increase in new-age ailments such as chronic fatigue syndrome, chronic pain, tinnitus, depression, hormone dysfunction, Alzheimer's disease and leukemia, and with the huge spike in childhood cancers.

EMFs have been linked to many serious diseases including ALS, brain tumours and miscarriages and have been shown to exacerbate a number of chronic illnesses including allergies, tinnitus, diabetes and Multiple Sclerosis.

EMF Health Facts:

- Sweden, which recognized Electromagnetic Hypersensitivity as a fully-functional impairment in 2001, now lists electromagnetic fields (EMF) as Class 2 Carcinogens, right along with tobacco.

- Professor Magda Havas at Trent University in Peterborough, Ontario found significant links between dirty electricity in homes and schools and diseases like Multiple Sclerosis and diabetes with asthma, autism, ADD/ADHD in children.

- The US Environmental Protection Agency (EPA) recommends that EMFs be classified as a Class B carcinogen – a "probable human carcinogen and joined the ranks of formaldehyde, DDT, dioxins and PCBs and warns: "There is reason for concern" and advises "prudent avoidance."

- Martin Halper, the EPA's Director of Analysis and Support says, "I have never seen a set of epidemiological studies that remotely approached the weight of evidence that we're seeing with EMFs. Clearly there is something here."

- Research indicates that EMFs suppress the immune system's response to ongoing processes such as tumor growth. David Carpenter, Dean at the School of Public Health, State University of New York believes it is likely that up to 30% of all childhood cancers come from exposure to EMF.

Exposure to harmful magnetic fields has been linked, according to European research, to increased risk of cancer and other serious health problems, including immune system dysfunction, chronic fatigue, allergies, and depression.

- A scientific report released in 1994 suggested a possible link between occupational EMF exposure and increased incidence of Alzheimer's disease. This study also found a higher incidence of Alzheimer's disease among tailors and dressmakers due to the high magnetic field produced by the sewing machines.

- In women there is strong scientific evidence linking ongoing exposure to EMFs and the huge increase in breast cancer in recent years. In men, EMFs reduced testosterone – a hormone drop that has been linked to testicular and prostate cancers.

Ongoing News: WEEP: Canadian Initiative to Stop Wireless, Electric, and Electromagnetic Pollution See: www.weepinitiative.org