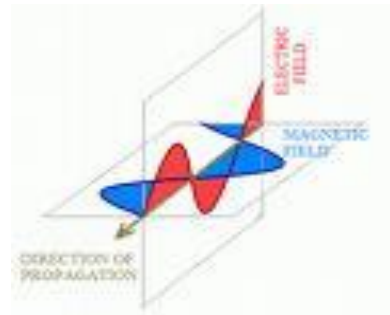


Understanding Electric and Magnetic Fields (EMF)

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 away from the source 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). EMF pollution is similar to water or air pollution, there are four EMF components, they are all measured differently and all have the potential to harm your health.



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 a live electric outlet. An electric field will exist even when there is no current flowing.

Electric fields exposure points: Energy-efficient CFL bulbs, laptop computers, ungrounded metal lamps, electrical cords and power bars.

Magnetic fields are measured in *milligauss (mG.)* 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 while the electric field strength will remain constant.



Magnetic fields exposure points: High current power lines and electrical wiring, transformers, plumbing current, knob & tube wiring, transformers, old-style CRT TVs and monitors.



Dirty Electricity is measured in *Graham-Stetzer units (GS)*. Today our electrical systems have become 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 electronic devices such as computers, big screen TVs, energy efficient CFL bulbs and 12-volt lighting and dimmer switches that all use electricity in short pulses as

opposed to a continuous flow. This results in high frequency noise on our electrical circuits.

Dirty Electricity exposure points: All power lines, cords, electrical appliances, lamps and electronic devices plugged into circuits reading greater than 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 networks, cell phones, wireless gaming systems, satellite TV and radar.

Radio Frequency exposure points: Smart phones, tablets, cell phones, cell phone towers, microwave ovens, DECT cordless portable phones and baby monitors, as well as Wi-Fi routers, Bluetooth enable devices such as wireless printers, mice/keyboards as well as Wii and Xbox gaming systems.



Electrical Hypersensitivity (EHS)

Today, more and more people are experiencing adverse health effects as a result of ongoing exposure to Electric and Magnetic Fields (EMF). Today it is estimated that 3-8% of populations in developed countries experience serious electro-hypersensitivity symptoms and 35% to 50% experience less severe symptoms. 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 man-made EMFs and their 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 insomnia, chronic fatigue syndrome, chronic pain, tinnitus, anxiety, depression, nervous system disorders, ALS, Parkinson's disease, hormone dysfunction, Alzheimer's disease and with the huge spike in childhood cancers. In 2001 Sweden recognized Electromagnetic Hypersensitivity as a functional impairment.

EMFs have been linked to many serious diseases including brain and salivary gland tumors, Parkinson's disease, and has been shown to exacerbate a number of chronic illnesses including, diabetes, allergies, tinnitus as well as Multiple Sclerosis and other diseases.

EMF Health Facts:

- On May 27, 2011 the Parliamentary Assembly of the Council of Europe, an international, democratically elected parliament with members from 47 countries, called on European governments to "take all reasonable measures" to reduce exposure to electromagnetic fields.

- In May of 2011 The WHO International Agency for Research on Cancer issued its decision that non-ionizing radiofrequency radiation from wireless devices classifying it as a 2B (Possible) Carcinogen. This mirrors the 2001 IARC finding that extremely low frequency (ELF-EMF) that classified as a 2B (Possible) Carcinogen that pertained to power frequency (AC power lines and appliance) radiation.

- A study released in 2008 by the Centers for Disease Control and Prevention that was based on data representing 90 percent of the U.S. population found cancer rates for children highest in the Northeast US. Lead author of the study Dr. Jun Li said: "Environmental factors might play a role, including exposure to radiation. Radiation has been linked with the most common types of childhood cancer -- leukemia, lymphoma and brain cancers.

- Released in 2000, a study of 44,788 sets of twins from Sweden, Denmark and Finland concluded that environmental factors were the initiating event in the majority of cancers. The strongest contender and most likely culprit is artificial electromagnetic radiation.

- In 2009 Dr. Thomas Rau, Medical Director of the world renowned Paracelsus Clinic in Switzerland says he is convinced 'electromagnetic loads' lead to cancer, concentration problems, ADD, tinnitus, migraines, insomnia, arrhythmia, Parkinson's and even back pain.

- The California EMF Program (2002) concluded that (EMFs) from power lines, wiring in buildings, some jobs, and appliances can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease (ALS), and miscarriage.

- In blind studies Professor Magda Havas at Trent University in Peterborough, Ontario found significant links between dirty electricity (radiation on electrical wires) in homes and schools and diseases like Multiple Sclerosis and diabetes and to asthma and ADD/ADHD in children.

- Martin Halper, the Environmental Protection Agency 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."

- 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 EMFs.