

EMFs in the Home

Electromagnetic Fields

Can the electric and magnetic fields (EMFs) to which people are routinely exposed cause health effects? What are sources of EMFs, and when are they dangerous?

An "electromagnetic field" is a broad term which includes electric fields generated by charged particles in motion, and radiated fields, such as TVs, radios, hair dryers and microwave ovens. Electric fields are measured in units of volts per meter, or V/m. Magnetic fields are measured in milli-Gauss, or mG. The field is always strongest near the source and diminishes as you move away from the source. These energies have the ability to influence particles at great distances. For example, the radiation from a radio tower influences the atoms within a distant radio antenna, allowing it to pick up the signal. Despite the many wonderful conveniences of electrical technology, the effects of EMFs on biological tissue remains the most controversial aspect of the EMF issue, with virtually all scientists agreeing that more research is necessary to determine safe or dangerous levels.

Research since the mid-1970s has provided extensive information on biological responses to power-frequency electric and magnetic fields. The Electric and Magnetic Fields (EMF) Research and Public Information Dissemination (RAPID) Program was charged with the goal of determining if electric and magnetic fields associated with the generation, transmission and use of electrical energy pose a risk to human health. The fact that 20 years of research have not answered that question is clear evidence that health effects of EMF are not obvious and that risk relationships, if risk is identified, are not simple. Because epidemiologic studies have raised concerns regarding the connection between certain serious human health effects and exposure to electric and magnetic fields, the program adopts the hypothesis that exposure to electric or magnetic fields under some conditions may lead to unacceptable risk to human health. The focus of the program is not only to test (as far as possible within the statutory time limits) that hypothesis for those serious health effects already identified, but to identify, as far as possible, the special conditions that lead to elevated risk, and to recommend measures to manage risk.

Electromagnetic hypersensitivity (ES) is a physiological disorder characterized by symptoms directly brought on by exposure to electromagnetic fields. It produces neurological and allergic-type symptoms. Symptoms may include, but are not limited to, headache, eye irritation, dizziness, nausea, skin rash, facial swelling, weakness, fatigue, pain in joints and/or muscles, buzzing/ringing in the ears, skin numbness, abdominal pressure and pain, breathing difficulty, and irregular heartbeat. Those affected persons may experience an abrupt onset of symptoms following exposure to a new EMF, such as fields associated with a new computer or with new fluorescent lights, or a new home or work environment. Onset of ES has also been reported following chemical exposure. A concerted effort to provide scientifically valid research on which to base decisions about EMF exposures is underway, and results are expected in the next several years. Meanwhile, some authorities recommend taking simple precautionary steps, such as the following:

- Increase the distance between yourself and the EMF source – sit at arm's length from your computer terminal.
- Avoid unnecessary proximity to high EMF sources – don't let children play directly under power lines or on top of power transformers for underground lines.
- Reduce time spent in the field – turn off your computer monitor and other electrical appliances when you aren't using them.

The Office of Technology Assessment of the Congress of the United States recommends a policy of "prudent avoidance" with respect to EMF. "Prudent avoidance" means to measure fields, determine the sources, and act to reduce exposure.

1. Detect EMFs in your home and work environment. It is good to know where the sources of EMFs are in your everyday world and how strong these sources are. Is there wiring in the wall behind your bed that you don't even know about? Is the vaporizer emitting strong fields in the baby's room? How much EMFs are you and your family getting from the power lines in the street? Even

hair dryers emit EMFs. Home inspectors often have meters to measure EMFs, or they can be purchased and shared with friends.

2. Diminish your exposure to the EMFs you find. Determine how far you must stay away from the EMF emitters in your home and work environment to achieve less than 2.5 mG of exposure — the microwave oven, the alarm clock, the computer, and so on. Rearrange your furniture (especially the beds, desks, and couches where you spend the most time) away from heaters, wiring, fluorescent lights, electric doorbells, and other EMF "hot spots." Where practical, replace electrical appliances with non-electric devices. Have an electrician correct faulty high EMF wiring and help you eliminate dangerous stray ground currents. Consult a qualified EMF engineer, if necessary. Contact the National Electromagnetic Field Testing Association at 1-847-475-3696 for consultants in your area.
3. Shield yourself. Use shielding devices on your computer screen and cellular phone. Add shielding to your household wiring, circuit box and transformers.

Magnetic fields are not blocked by most materials. Magnetic fields encountered in homes vary greatly. Magnetic fields rapidly become weaker with distance from the source.

- Electric fields in the home, on average, range from 0 to 10 volts per meter. They can be hundreds, thousands, or even millions of times weaker than those encountered outdoors near power lines.
- Electric fields directly beneath power lines may vary from a few volts per meter for some overhead distribution lines to several thousands of volts per meter for extra-high voltage power lines.
- Electric fields from power lines rapidly become weaker with distance and can be greatly reduced by walls and roofs of buildings.