

Electromagnetic Fields - Real Estate Information

Ask Juliana Lee

National Cancer Institute - Electromagnetic Fields and Cancer

The National Cancer Institute has a web page discussing [electromagnetic fields and cancer](#). Electric and magnetic fields which people are often exposed to are at a lower frequency than x-rays and gamma rays. These lower frequency fields are in the non-ionizing frequency range and are not known to damage DNA or cells directly. The National Cancer Institute web page states that "No mechanism by which ELF-EMFs or radiofrequency radiation could cause cancer has been identified".

However there has been speculation that non-ionizing EMFs might cause cancer without damaging DNA or cells directly. With the widespread exposure to these fields even a small increase in risk would be of importance. Studies have been performed to evaluate the risk. A number of studies are referenced.

Possible Associations Between Non-ionizing EMFs and Cancer in Children

"Most of the research has focused on leukemia and brain tumors, the two most common cancers in children. Studies have examined associations of these cancers with living near power lines, with magnetic fields in the home, and with exposure of parents to high levels of magnetic fields in the workplace. No consistent evidence for an association between any source of non-ionizing EMF and cancer has been found."

Power Lines and Electrical Appliances

For radiation from power lines and electrical appliances some studies reported an increase in leukemia among children having the highest level of exposure (0.3µT or higher) but the number of children having that exposure was too few to provide meaningful statistics.

Exposure to Wi-Fi

The National Cancer Institute states: "A review of the published literature concluded that the few high-quality studies to date provide no evidence of biological effects from Wi-Fi exposures" (for children).

World Health Organization - Electromagnetic Fields (EMF)

"Underneath power lines, magnetic fields can be about 20 µT and electric fields can be several thousand volts per metre. However, average residential power-frequency magnetic fields in homes are much lower - about 0.07 µT in Europe and 0.11 µT in North America. Mean values of the electric field in the home are up to several tens of volts per metre."

The difficulty determining if the risk of childhood leukaemia is increased by electromagnetic fields is due in part to the rarity of the disease and the rarity of high EMF exposure. Quoting the [WHO Electromagnetic Fields web page](#):

"Childhood leukaemia is a comparatively rare disease with a total annual number of new cases estimated to be 49,000 worldwide in 2000. Average magnetic field exposures above 0.3 µT in homes are rare: it is estimated that only between 1% and 4% of children live in such conditions. If the association between magnetic fields and childhood leukaemia is causal, the number of cases worldwide that might be attributable to magnetic field exposure is estimated to range from 100 to 2400 cases per year, based on values for the year 2000, representing 0.2 to 4.95% of the total incidence for that year. Thus, if ELF magnetic fields actually do increase the risk of the disease, when considered in a global context, the impact on public health of ELF EMF exposure would be limited." (There are about 130 million births per year, 1.9 billion children)

"A number of other adverse health effects have been studied for possible association with ELF magnetic field exposure. These include other childhood cancers, cancers in adults, depression, suicide, cardiovascular disorders, reproductive dysfunction, developmental disorders, immunological modifications, neurobehavioural effects and neurodegenerative disease. The WHO Task Group concluded that scientific evidence supporting an association between ELF magnetic field exposure and all of these health effects is much weaker than for childhood leukaemia. In some instances (i.e. for cardiovascular disease or breast cancer) the evidence suggests that these fields do not cause them."

Electric Blankets etc.

Electromagnetic fields rapidly decrease in strength with the distance from the source. A field strength measured 10 feet away from a source would be expected to be about 1/100 th of the strength measured 1 foot away. A source of powerline electromagnetic fields which is used for long periods of time and is very close to human bodies is electric blankets.

A study (<https://academic.oup.com/aje/article/152/1/41/139166>) concluded "In conclusion, our findings did not support an important association between exposure to EMFs from lifetime electric blanket use and breast cancer. Our findings were generally null, although the confidence intervals around our risk estimates did not exclude a small excess risk in those with the longest duration of exposure many years before diagnosis."

To see some numbers I've got a short quote "In the indoor environment, high values have been measured close to several domestic appliances (up to the mT range), some of which are held close to the body, e.g., hair dryers, electric shavers." Typical average 24 hour exposure values in the U.S. are about 0.1 uT (1 mT = 1000 uT).

Risk Is Never Zero

My own personal "take-away" is that risk is never zero. Life is about balancing risks. For a family with school age children, traffic safety should probably get much more emphasis than powerline fields when choosing a home. Personal choices about using electrical devices (cell phones, electric blankets, microwave ovens, hair dryers, electric shavers, etc.) can significantly change your exposure to electromagnetic fields.

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Juliana Lee, Real Estate Agent

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