Conference of Radiation Control Program Directors, Inc.

Fact Sheet

Questions and Answers About EMF

What are EMF?

"EMF" is an abbreviation for "electric and magnetic fields." EMF refer specifically to fields arising from 60 hertz alternating current. Electric power is produced as an electric current that has a frequency of 60 hertz (one hertz is equal to one cycle per second). Electric and magnetic fields are produced by anything that conducts or uses that electricity.

What are the sources of EMF?

EMF are produced by all components of the electric transmission and distribution system, including transmission lines, transformers, distribution lines, household wiring, and all electric or electronic devices in the home or workplace.

Can EMF affect me?

There is general agreement among scientists that EMF can cause biological effects. Laboratory studies have shown that under certain conditions fields can cause effects. Still, there is no clear evidence that these biological effects lead to any form of disease in humans, including cancer.

Does EMF exposure cause cancer?

Some epidemiology studies have linked an increase in childhood leukemia with increased exposure to EMF, primarily from powerlines (which may include high voltage transmission lines and lower voltage distribution lines). In these studies, the increase was seen when the EMF exposure was estimated. When EMF were measured directly, the increase was less or not seen at all. This suggests that measurements may underestimate exposure or that some other factor may be present that is unknowingly being included with the estimate.

Is there a harmful level of EMF?

There is not enough information to determine a level that is absolutely safe or absolutely harmful. Exposure to EMF comes from many sources and the field strengths and characteristics will differ from source to source. For example, many home appliances will have a higher EMF level than powerlines, but the time of exposure may be much less. This may or may not be significant. That is, exposure to higher levels or over extended time periods may not be worse. Until such distinctions can be made, risks from exposure to EMF will not be known.

Does EMF exposure cause other illness?

There is no compelling evidence that EMF exposure is a cause of increased incidence of any other disease.

Should EMF exposure to children or pregnant women be of concern?

Present research does not indicate that it is necessary to avoid exposure to EMF. However, children and unborn babies can be more sensitive to many factors, not just EMF. For this reason, pregnant women may choose to minimize their exposure to caffeine or alcohol. If you are concerned, it is possible to reduce EMF exposure. You may use electric blankets only to warm the bed before retiring, rather than sleeping under them. You may also stand farther from electrical appliances such as washers and dryers, and/or limit your use of electric hairdryers. You may arrange your workspace to remain at least three feet from the back or sides of video display terminals.

What are the sources of EMF exposure in my home?

Although no two houses are identical, the EMF in homes come from home wiring and grounding, the electrical appliances, and the electrical distribution line to the home.

Could my child's school have high EMF levels?

There are many things about schools that make them different from homes. They are big buildings and may contain transformer vaults or wiring in the walls or floors with high localized fields. They are more likely than homes to be built in or near utility rights-of-way. The kind of equipment and lighting used is likely to be different from that in homes as well. These factors will affect the EMF level in the school and may affect the risk, if any exists.

Are transmission lines a cause for concern?

Research has shown that many people believe that any transmission line they see can expose them to high fields. This is not true. Although fields are high directly under transmission lines, they drop off quickly as you move away from the lines. For a typical 115,000 volt line, the average level under the line is 20 milligauss and drops to 1 milligauss at 100 feet, to 0.3 milligauss at 200 feet.

Are transformers or substations a cause for concern?

While transformers need strong fields to operate, they are designed to keep almost all the field inside. And since the EMF levels drop off with distance, you won't get close enough to a substation or a pole-mounted transformer to be exposed to high EMF levels. EMF levels at the fence of a substation are due to the lines coming in to the station, rather than the transformers or switchgear inside. Pad-mounted transformers should be treated carefully, as you would any other source of high voltage.

Should I have EMF levels in my home measured?

Limited information can be gained from a single measurement in your home. There is no basis for interpretations of the measurements relative to possible health effects at this time. Based on epidemiologic studies, spot measurements are poor predictors of potential risk. However, measurements may identify areas of higher or lower EMF levels.

Can someone measure the EMF levels in my home or school?

You may be able to get assistance from your local utility or health department. There may also be commercial companies in your area which provide this service.

References

Electromagnetic Fields (EMF) In Your Environment. US Environmental Protection Agency, Office of Radiation Programs, 1992.

Lee JM, Chartier VL, Hartmann DP, Lee GE, Pierce KS, Shon FL, Stearns RD, Zeckmeister MT. Electrical and Biological Effects of Transmission Lines: A Review. US Department of Energy, Bonneville Power Administration, 1989.

Nair I, Morgan MG, Florig HK. Biological Effects of Power Frequency Electric and Magnetic Fields. OTA-BP-E-53, Washington DC: US Government Printing Office, May 89.

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